

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF OHIO
EASTERN DIVISION**

Ridge Corporation,
1201 Etna Parkway
Pataskala, Ohio 43062

Plaintiff,

vs.

Kirk National Lease Co.,
3885 W. Michigan St.
Sidney, Ohio 45365
c/o Registered Agent
John Garmhausen
100 S Main Ave, Suite 300
Sidney, Ohio 45365; and,

Truck & Trailer Parts Solutions Inc.
3858 W. Michigan Ave.
Sidney, Ohio 45365
c/o Registered Agent
John Garmhausen
100 S Main Ave, Suite 300
Sidney, Ohio 45365;

Transglobal, Inc.
500 N. Warpole St.
Upper Sandusky, Ohio 43351
c/o Registered Agent
James Schroeder
5489 Brookview Lane
Upper Sandusky, Ohio 43351; and

Altum LLC
92 Elm Street, Suite B,
Canal Winchester, Ohio 43110
c/o Registered Agent
Kyle Timothy Gaines
403 Streamwater Drive
Blacklick, Ohio 43004,

Defendants.

Case No. 2:23-cv-03012

COMPLAINT,
with Demand for Jury Trial

Plaintiff Ridge Corporation (“**Ridge**”), by and for its Complaint for patent infringement against Defendants Kirk National Lease Co. (“**KNL**”), Truck & Trailer Parts Solutions Inc. (“**TTPS**”), Transglobal, Inc. (“**Transglobal**”), and Altum LLC (“**Altum**”) (collectively, “Defendants”), alleges to the Court as follows:

PARTIES

1. Ridge is a domestic corporation organized and existing under the laws of Ohio, having its principal place of business at 1201 Etna Parkway, Pataskala, Ohio, 43062.

2. KNL is a domestic corporation organized and existing under the laws of Ohio, having its principal place of business at 3885 W. Michigan Street, Sidney, Ohio 45365. KNL may be served with a summons through its Registered Agent on file with the Ohio Secretary of State’s Office, as follows: John Garmhausen, 100 S Main Ave, Suite 300, Sidney, Ohio 45365.

3. TTPS is a domestic corporation organized and existing under the laws of Ohio, having its principal place of business at 3858 W. Michigan Avenue, Sidney, Ohio 45365. TTPS may be served with a summons through its Registered Agent on file with the Ohio Secretary of State’s Office, as follows: John Garmhausen, 100 S Main Ave, Suite 300, Sidney, Ohio 45365.

4. Notably, KNL and TTPS have overlapping ownership and are affiliated entities.

5. Transglobal, Inc. is a domestic corporation organized and existing under the laws of Ohio, having its principal place of business at 500 N. Warpole Street, Upper

Sandusky, Ohio 43351. Transglobal may be served with a summons through its Registered Agent on file with the Ohio Secretary of State's Office, as follows: James Schroeder, 5489 Brookview Lane, Upper Sandusky, Ohio 43351.

6. Altum is a domestic limited liability company organized and existing under the laws of Ohio, having its principal place of business at 92 Elm Street, Suite B, Canal Winchester, Ohio 43110. Altum may be served with a summons through its Registered Agent on file with the Ohio Secretary of State's Office, as follows: Kyle Timothy Gaines, 403 Streamwater Drive, Blacklick, Ohio 43004.

JURISDICTION AND VENUE

7. This is an action for patent infringement arising out of Defendants' unauthorized making, using, offering for sale, and selling of a single panel roll-up door for use in trucks, trailers, and buildings, that violates Ridge's exclusive license for use of U.S. Patent No. 9,151,084 from Cold Chain, LLC. Because this action for infringement arises under the patent laws of the United States, 35 U.S.C. § 271, *et seq.*, this Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

8. This Court has personal jurisdiction over KNL because at all times pertinent to this Complaint KNL does business in this Judicial District, including marketing and, upon information and belief selling the infringing product in this Judicial District. Further, KNL publicly holds out its principal place of business and headquarters as being located in this Judicial District.

9. Venue as to KNL is proper in the Southern District of Ohio pursuant to 28 U.S.C. § 1400(b) because KNL has committed acts of infringement in this Judicial District and has a regular and established place of business in this District. Venue as to KNL within

the Eastern Division is proper pursuant to Loc.R. 82.1(c), because Altum's principal place of business is within the Eastern Division.

10. This Court has personal jurisdiction over TTPS in that at all times pertinent hereto, upon information and belief, TTPS offers for sale and sells the infringing product in this Judicial District. On information and belief, TTPS's principal place of business is located in this Judicial District.

11. Venue as to TTPS is proper in the Southern District of Ohio pursuant to 28 U.S.C. § 1400(b) because TTPS has committed acts of infringement in this Judicial District and has a regular and established place of business in this District. Venue as to TTPS within the Eastern Division is proper pursuant to Loc.R. 82.1(c), because Altum's principal place of business is within the Eastern Division.

12. This Court has personal jurisdiction over Transglobal in that at all times pertinent hereto, upon information and belief, Transglobal offers for sale and sells the infringing product in this Judicial District.

13. Venue as to Transglobal is proper in the Southern District of Ohio pursuant to 28 U.S.C. § 1400(b) because Transglobal has committed acts of infringement in this Judicial District. Venue as to Transglobal within the Eastern Division is proper pursuant to Loc.R. 82.1(c), because Altum's principal place of business is within the Eastern Division.

14. This Court has personal jurisdiction over Altum in that at all times pertinent hereto, upon information and belief, Altum has its principal place of business in this Judicial District and within the Eastern Division and is committing infringing acts at least in this Judicial District and within the Eastern Division. More specifically, upon information and belief, Altum makes and sells key components made specifically for use in the manufacture

of the infringing product in this Judicial District and within the Eastern Division for use in this Judicial District as well as across the United States.

15. Venue as to Altum is proper in the Southern District of Ohio and within the Eastern Division pursuant to 28 U.S.C. § 1400(b) because Altum has committed acts of infringement and inducement in this Judicial District and has a regular and established place of business in this Judicial District and within the Eastern Division.

BACKGROUND

Ridge's Intellectual Property at Issue, the Commercial Lightweight, Single Panel Roll-up Door

16. Ridge is a manufacturing and engineering company that produces advanced composites, specializing in resilient, lightweight, continuous, glass-reinforced, thermoplastic laminates and sandwich panels.

17. United States Patent No. 9,151,084 (at times called the “‘084 Patent,” but defined for purposes of this Complaint as the “**Cold Chain Patent**”) was duly and legally issued by the United States Patent and Trademark Office (USPTO) on October 6, 2015. A true and accurate copy of the Cold Chain Patent is attached as **Exhibit 1**.

18. By license agreement (“**License Agreement**”) dated February 15, 2023 by and between Cold Chain, LLC (“**Cold Chain**”) and Ridge, Ridge is the exclusive licensee of the Cold Chain Patent and United States Patent No. 9,151,084 to Cold Chain. A true and accurate copy of the License Agreement is attached to this Complaint as **Exhibit 2**.

19. The License Agreement was amended and restated on May 1, 2023 (“**Amended and Restated License Agreement**”). A true and accurate copy of the Amended and Restated License Agreement is attached as **Exhibit 3**.

20. Ridge is the exclusive licensee of the Cold Chain Patent and is entitled to receive all damages and the benefits of all other remedies for Defendants' infringement. Per Section 14 of the Amended and Restated License Agreement, Ridge gave Cold Chain the option of initiating this infringement action, instead of the exclusive licensee Ridge, and Cold Chain declined the option. Thus, Ridge has proceeded with this action.

21. The Cold Chain Patent describes the patented product in its Abstract section as:

An article of manufacture for use as an insulated overhead door that is designed to roll open and closed in tracks, with a sheet of thermoplastic material that acts as the outer door membrane and barrier to entry, a sheet of insulating material that acts as a base insulating barrier adhered to the thermoplastic membrane. (**Ex. 1.**)

22. The Cold Chain Patent has 19 claims. (**Ex. 1.**)

23. Ridge has invested substantial time and economic resources in preparation for its large-scale manufacture, sale, and distribution of a single panel roll-up overhead door in partnership with other businesses actively involved in this market space.

24. Defendants have committed patent infringement and other tortious acts that are causing imminent and irreparable harm to Ridge and its investment in Ridge's single panel overhead door (the "**Ridge Door**")¹ for which Ridge's rights are exclusive and protected by the Cold Chain Patent.

¹ The Ridge Door is created through Ridge supplying panels and working with Whiting Door Corporation ("**Whiting Door**") and other partners to build out and complete the door. This is only able to be legally accomplished because Ridge grants Whiting Door a sub-license to the Cold Chain Patent to allow for the manufacturing process.

**Background on Failed Joint Venture
Between Ridge and KNL**

25. In or about October 2018, Jeff Phlipot of KNL approached Ridge about creating panels for a potential roll-up door application.

26. At that time, when KNL approached Ridge in October 2018, Ridge had already developed its “living hinge” technology based on the capability of Ridge’s state-of-the-art composite materials to be engineered for various bending applications, including trailer air foils and roll-up doors.

27. Based on Ridge’s unique understanding of the living-hinge concept and the material properties of its panels and skins, including with prior truck door applications, Ridge determined that it could employ its living-hinge concept to engineer a single panel roll-up door for KNL’s application.

28. Thereafter, working with KNL to understand its specific application requirements, Ridge engineered and produced drawings for a single panel roll-up door employing Ridge’s living-hinge concept to enable the roll-up door to effectively bend around the tight radius required for the roll-up door product that Ridge was jointly developing with KNL.

29. However, in the process of the joint venture between KNL and Ridge, there were disagreements about business terms and commercial implementation for the venture.

30. Further, Ridge learned in doing due diligence on the joint venture that the jointly created invention would infringe upon an already existing patent—the Cold Chain Patent.

31. Ridge subsequently contacted Cold Chain and worked on active discussions to acquire exclusive rights to the Cold Chain Patent so that Ridge could work on its own towards making its business concept for the living-hinge technology a reality.

**KNL Joins Forces with a Company Formed for the Purpose of
Unfair and Illegal Competition against Ridge (Altum, LLC)
to Infringe Upon the Cold Chain Patent**

32. On or about February 19, 2022, KNL filed U.S. Patent Application 17/676,144 for a “Single Panel Roll-up Door” (“’144 Patent Application”). A true and accurate copy of the ‘144 Patent Application is attached as Exhibit 4.

33. Because Ridge contributed to both the concept and reducing the concept to a complete and operative single panel roll-up door (the “**Infringing Door**”) that infuses Ridge’s living-hinge technology, which was the subject of KNL’s ‘144 Patent Application, Ridge is (through its employee, Bret Moss, and others) a legal and proper joint inventor of the subject matter claimed in KNL’s ‘144 Patent Application.

34. Despite Ridge’s role in developing the Infringing Door that is the subject of the ‘144 Patent Application, KNL failed to accurately list Ridge as a joint inventor in the ‘144 Patent Application.

35. On June 6, 2023, Ridge’s counsel sent KNL a letter requesting that KNL correct the inventorship of the ‘144 Patent Application (“**June 6 Letter**”). A true and accurate copy of the June 6 Letter is attached to this Complaint as Exhibit 5.

36. After receiving the June 6 Letter, KNL disputed that Ridge contributed to either the conception or reduction to practice of the subject matter claimed in the ‘144 Patent Application, yet KNL failed to show any support for its theory (“**June 30 Email**”). A true and accurate copy of the June 30 Email is attached to this Complaint as Exhibit 6.

37. Ridge's patent counsel then sent KNL's patent counsel (Mr. Andrew R. Barnes, Esq.) an email with clear evidence attached showing that Ridge contributed to the concept and reducing the concept into a complete and operative door product ("**July 2 Email**"). A true and accurate copy of the July 2 Email and attachments are attached to this Complaint as **Exhibit 7**, proving joint inventorship by Ridge of the subject matter of the '144 Patent Application.

38. Despite receiving clear evidence of Ridge's joint inventorship, KNL has failed to show any support for its proposition that Ridge did not need to be listed as a joint inventor on the '144 Patent Application.

39. KNL has not corrected the inventorship of the '144 Patent Application.

Defendants' Business and Infringement

40. Per Altum's website, <https://altumcomposites.com/>, Altum is a "custom composites manufacturer specializing in reinforcing thermoplastics products." (last accessed 9/19/2023). This is the same line of business in which Ridge operates.

41. Per Altum's website, Altum's three employees are former Ridge employees Dominic Grandominico ("**Grandominico**"), 14-year co-owner of Ridge and Director of Operations; Greg Karst ("**Karst**"), former 4-year Ridge employee and Product Development Engineer; and Kyle Gaines ("**Gaines**"), former 13-year Ridge employee and Director of Purchasing.

42. Upon information and belief, after Ridge and KNL stopped pursuing joint development of the Infringing Door, KNL went to Altum to develop the Infringing Door.

43. Per KNL's website, <https://www.knl.cc/about/>, KNL is a "privately owned fleet solutions company, specializing in truck/trailer/bus repair & equipment leasing." (last accessed 9/19/2023).

44. Upon information and belief, Altum supplies KNL with a panel that is used to make the Infringing Door.

45. Altum has induced the patent infringement at issue in this Complaint and has specifically instructed KNL on how to make the Infringing Door, which directly infringes the Cold Chain Patent to which Ridge owns an exclusive license.

46. Upon information and belief, KNL, TTPS, and Altum have subcontracted with Transglobal to produce the Infringing Door. Upon information and belief, the panels come from Altum and then are sent to KNL which routes the relief cuts to facilitate the living-hinge technology, then to Transglobal, which adds hardware and modifications to the panels, that are then sent to KNL and TTPS, which sell the Infringing Door.

47. Ridge learned of Transglobal's involvement because it discovered a specimen of the Infringing Door at a 2023 tradeshow held by the National Truck Equipment Association (NTEA), and it was made using a Transglobal panel.

48. Transglobal, Inc.'s website at, <https://www.transglobaldoor.com>, indicates that Transglobal: "manufactures a variety of products for the transportation industry including dry-freight wood, 1/4 and 1/2 composite doors, refrigerated doors, replacement parts, ramp door spring systems and many other quality products." *Id.* (last accessed 9/17/2023). Notably, all the door types that Transglobal describes having experience making in the above-quoted portion of its website are not single-panel doors like the Ridge Door or the Infringing Door. Rather, Transglobal references doors that have been used by many

companies over the past 10 years, and which are entirely different from the cutting-edge lightweight technology of the Ridge Door and the Infringing Door.

49. KNL is actively working with Altum, including Grandominico, Karst, and Gaines, as well as Transglobal to produce the Infringing Door, which infringes on the Cold Chain Patent.

50. As established in the Claim Chart Exhibit comparing the '084 Patent claims to the Infringing Door (**Ex. 16**), the accused door includes every feature of the claims of the Cold Chain Patent. The accused Infringing Door, therefore, infringes the Cold Chain Patent.

51. The language in the Claim Chart Exhibit is long and wordy for the sake of precision. But, to simplify, a single panel roll-up door is essentially a foam sandwich made up of a middle layer of structural foam sandwiched between two outer layers to form a panel that is then engineered to bend around tracks in the back of the truck, so that the door can roll up and down on the tracks. The particular nature and dimensions of the materials to be used for the outer layers, also called “skins” or “outer skins” depends on the particular end use to which the panel will be put. In this case the outer skins are glass fiber reinforced thermoplastic (i.e., fiberglass) because such truck doors need to be durable and capable of withstanding strikes, punctures, abrasions and the like. Similarly, the particular nature and dimensions of foam to be used as the core material are likewise selected based on the thermal and structural requirements of the end application. In the present case, the combination of fiberglass outer skins and foam core produces a single panel that has the necessary structure and durability for application as a truck door. The engineering trade-off for attaining the necessary structural strength and durability is that the panel is somewhat stiff. Thus, for the panel to serve as a roll-up door, grooves are formed on the inside surface of the door by cutting away portions of

the skin and foam core, to form so-called “compression gaps” as shown in the Claim Chart. The compression gaps have the effect of making the panel flexible along its length, so that it can bend around the curved tracks in the back of the truck and go up and down between open and closed positions.

52. The description above may not sound like much, but it is a big deal. It takes a great deal of skill, experience, and engineering to develop and manufacture a panel having the proper materials, dimensions, thermal, and physical characteristics to effectively and reliably function as a commercial single panel roll-up door. The inventors at Cold Chain successfully conceived of how to accomplish this—and the United States Patent & Trademark Office granted the ‘084 Patent, securing exclusive rights for the invention to Cold Chain and its licensees.

53. The patented technology underlying the Cold Chain Patent has huge commercial advantages over prior technologies. The patented single panel roll-up door has fewer parts and is much easier to manufacture than traditional multi-panel constructs, leading to significant reductions in material and manufacturing costs, as well as increasing product reliability. The patented single panel door also presents a large, commercially desirable continuous surface for advertising and information display. The Defendants seek to improperly usurp those benefits without right or license, and therefore willfully infringe the Cold Chain Patent.

54. Upon information and belief, KNL, TTPS, Altum, and Transglobal (potentially with the use, at times, of subcontractors hired by Defendants) make the Infringing Door.

55. The exact corporate relationship between TTPS and KNL is unknown to Ridge, however, it appears that TTPS functions in part as the public-facing or sales arm for joint operations between KNL and TTPS.

56. Per TTPS's website, at <https://tppsusa.com/>, TTPS lists its services as “tarp systems, APUs, solar solutions, liftgates, and custom solutions.” (last accessed 9/19/2023).

57. TTPS's website features the false marking claim that TTPS, in conjunction with its affiliate KNL, produces a “**patented** single panel roll door” and advertises it as “Market-Ready Q3 2023.” (Emphasis added to TTPS and KNL's false marking). A screenshot from the front page of the TTP's website is attached as **Exhibit 8**, and an excerpt of it is provided below.

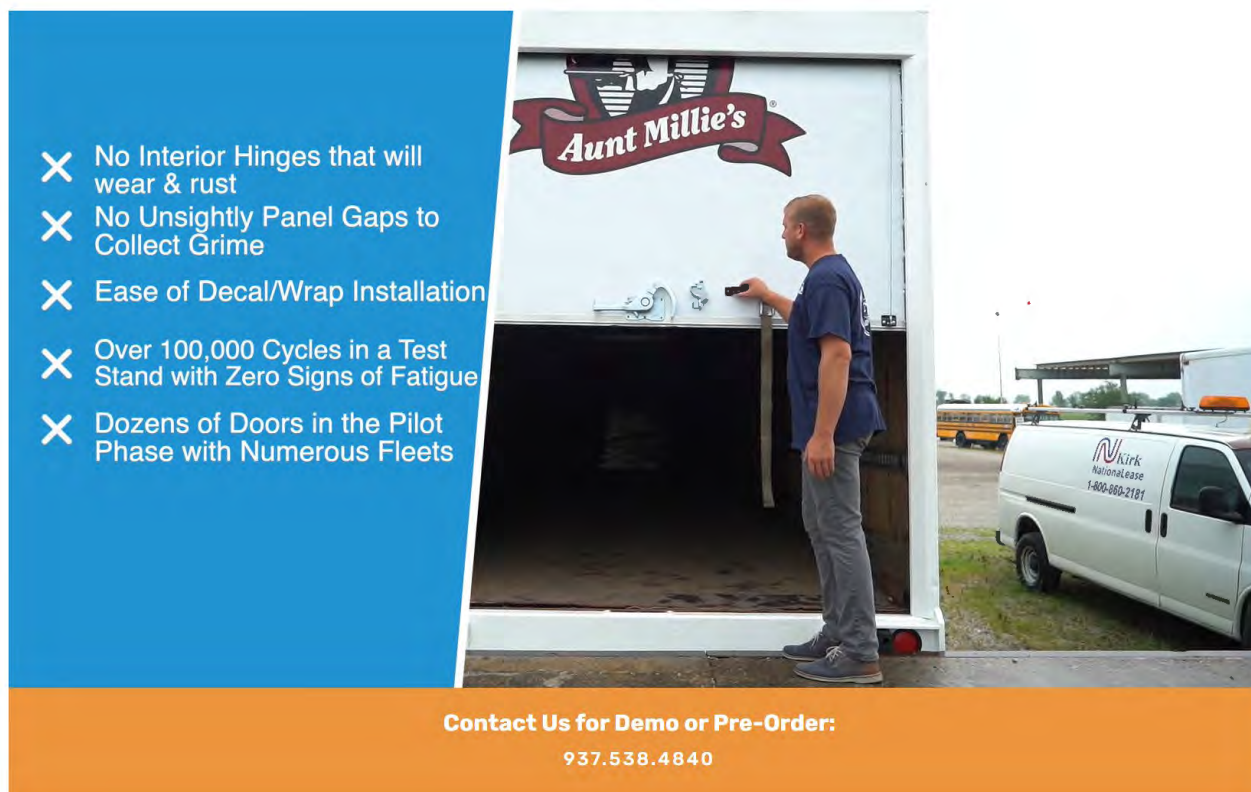


(**Ex. 8.**)

58. As can be plainly seen above, TTPS falsely marked the Infringing Door as “patented” on its website. (**Ex. 8.**)

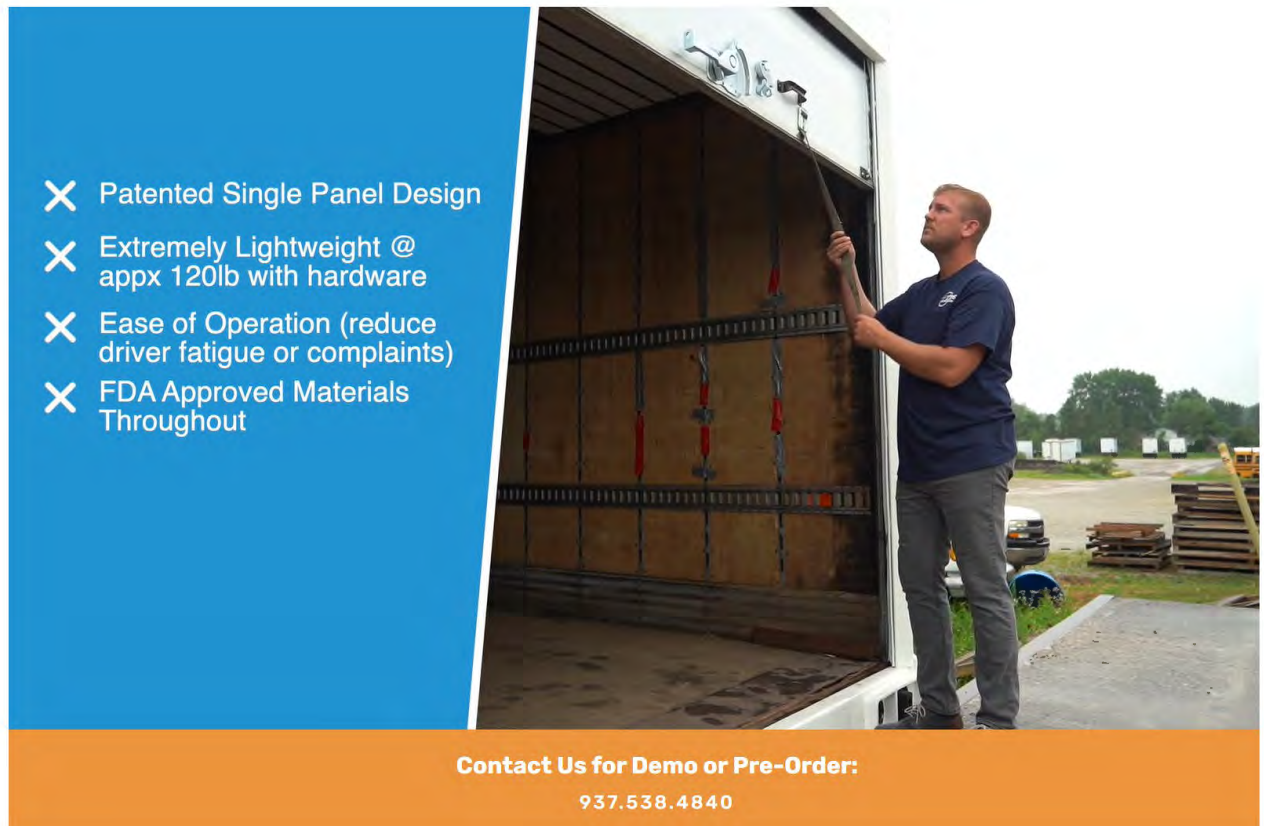
59. Clicking on the video-play icon results in a demo of the Infringing Door along with bulleted statements relating to the extent of the Defendants' operations involving the

Infringing Door—and thus the imminent risk of irreparable market harm and heightened unfair competition against Ridge by KNL, TTPS, Transglobal, and Altum. A further screenshot excerpt of the bulleted claims in the video is included below:



(Ex. 8.)

60. The TTPS video goes on to include one final list of bulleted claims, which repeats the false marking of the Infringing Door as being a “Patented Single Panel Design.” See excerpt below:



The advertisement is split into two main sections. On the left, a blue vertical banner contains a list of four features, each preceded by a white 'X' icon. On the right, a photograph shows a man in a dark blue t-shirt and grey pants standing next to a white truck, operating a roll-up door. The door is partially unrolled, revealing a wooden interior with metal tracks and red safety straps. The background shows a parking lot with other vehicles and trees under a cloudy sky.

- ✗ Patented Single Panel Design
- ✗ Extremely Lightweight @ appx 120lb with hardware
- ✗ Ease of Operation (reduce driver fatigue or complaints)
- ✗ FDA Approved Materials Throughout

Contact Us for Demo or Pre-Order:
937.538.4840

(Ex. 8.)

61. TTPS knew that the Infringing Door was not patented when it made the claims that the Infringing Door was “patented.”

62. Not only was KNL on notice that the ‘144 Patent Application would not be granted as filed, but KNL was also on notice that the Infringing Door infringed upon the Cold Chain Patent.

63. As a result of TTPS’s false marking, Ridge’s ability to compete against TTPS in the market for purchasers of the single panel roll-up door is being imminently and irreparably impaired.

64. Not only are Defendants infringing upon the Cold Chain Patent with their Infringing Door, but they are lying to the limited demographic of commercial consumers for the product by saying that Defendants’ solution is patented. This marketing lie wrongly

implies to the consuming demographic that by purchasing any other door the purchaser could be subject to legal action—that is precisely why it is illegal to say that things are patented when they are not.

65. Thus, Defendants have beat Ridge to market and now imminently threaten to gain massive portions of the market share in the limited, niche market for commercial roll-up doors by claiming that their product is patented when it is not, and when it, in fact, infringes on the protected intellectual property rights of Ridge.

Defendants Have Notice and Knowledge of the Relevant Ridge Intellectual Property

66. On June 6, 2023, Ridge’s counsel sent KNL and TTPS a letter informing them that their single panel roll-up door infringes on one or more claims of the Cold Chain Patent and requesting they cease offering for sale and selling the Infringing Door and provide Ridge with an accounting of past sales (“**KNL/TTPS Cease and Desist Letter**”). A true and accurate copy of the KNL/TTPS Cease and Desist Letter is attached as **Exhibit 9**.

67. Ridge received a response to the KNL/TTPS Cease and Desist Letter on July 5, 2023, acknowledging receipt of the KNL/TTPS Cease and Desist Letter and stating that due to overlapping vacations in the next several weeks, counsel will respond “as soon as I am able to do so” (“**July 5 Letter**”). A true and accurate copy of the July 5 Letter is attached as **Exhibit 10**. Thus, nearly a full month after receiving a cease-and-desist letter for patent infringement, KNL and TTPS could only muster the response that they “would respond later.”

68. After receiving the July 5 Letter, Ridge’s counsel emailed KNL and TTPS’s lawyers and asked for confirmation of whether they would cease and desist. KNL and TTPS failed to provide any response to this email.

69. On August 1, 2023, Ridge received a response to the KNL/TTPS Cease and Desist Letter from counsel for KNL and TTPS denying the infringement allegations and stating that TTPS is not interested in any commercial solutions (“**August 1 Letter**”). A true and accurate copy of the August 1 Letter is attached as **Exhibit 11**.

70. On June 9, 2023, Ridge’s counsel sent Altum a letter requesting Altum cease and desist from making, using, selling, or offering for sale the Infringing Door and/or door panel (“**Altum Cease and Desist Letter**”). A true and accurate copy of the Altum Cease and Desist Letter is attached as **Exhibit 12**.

71. On July 10, 2023, Altum’s counsel responded to the Altum Cease and Desist Letter denying any infringement (“**July 10 Letter**”). A true and accurate copy of the July 10 Letter is attached as **Exhibit 13**.

72. On June 27, 2023, Ridge’s counsel sent Transglobal a letter requesting Transglobal cease and desist from offering for sale and selling the Infringing Door, and provide Ridge with an accounting of past sales (“**Transglobal Cease and Desist Letter**”). A true and accurate copy of the Transglobal Cease and Desist Letter is attached as **Exhibit 17**.

73. Notwithstanding Ridge’s demands, Ridge is informed and believes that Defendants continue to offer for sale and sell infringing single panel roll-up doors in willful and deliberate violation of Ridge’s intellectual property rights.

Defendants’ Tortious Interference with Ridge’s Business Relationships

74. KNL was one of Ridge’s customers and was aware that Ridge was developing the single panel roll-up door for use in trucks, trailers, and buildings.

75. After the failed joint inventorship, KNL decided to compete with Ridge and elicited the help of Altum.

76. Altum employee-principals Grandominico, Gaines, and Karst, who are former Ridge employees, knew that KNL was a Ridge customer. The Altum employee-principals are also aware of Ridge's long-term interest in developing a roll-up door like the Ridge Door, and Karst even worked on those efforts while he was employed at Ridge.

77. Altum and its CEO, Dominic Grandominico, have intentionally interfered with Ridge's business relationships through its inducement of the Defendants' infringement and ongoing role in the infringement, including interference with existing and prospective customers of the patented roll-up doors that Ridge is bringing to market.

78. KNL, by and through Mr. Barnes, sent a letter to Ridge's business partner, Whiting Door Corporation ("**Whiting Door**"), on September 6, 2023, that contained knowingly misleading statements to Whiting Door, all for the purpose of disrupting Ridge's business relationship with its important partner ("**Barnes Letter**"). A true and accurate copy of the Barnes Letter is attached as **Exhibit 14**.

79. The Barnes Letter is deeply concerning, both from the standpoint of the author and from the standpoint of KNL and TTPS directing it to be sent. The Barnes Letter to Whiting Door actively misleads a Ridge business partner by both citing a non-existent statute, 28 U.S.C. sect. 154(d), and threatening potential royalty damages for sales of Ridge's single panel door—even though KNL, TTPS, and their counsel, Mr. Barnes, knew that the '144 Patent Application would need to be amended in a manner that would preclude the threatened royalty damages, and further knew that any patent issuing from the '144 Patent Application would be unenforceable due to their failure to correct the inventorship of the '144 Patent Application as required.

80. In fact, five (5) days after the Barnes Letter to Whiting Door, Mr. Barnes filed a response to the U.S. Patent and Trademark Office (USPTO) that significantly amended the subject matter of all of the claims pending in the '144 Patent Application (“**Barnes USPTO Response**”), which evidences that his statements in the Barnes Letter were knowingly misleading as to the threatened royalty damages. A true and accurate copy of the Barnes USPTO Response is attached as **Exhibit 15**. Because those amendments were made, the threatened royalty damages are no longer available to the patent applicant. More specifically, the correct statute, 35 U.S.C. §154(d) (not 28 U.S.C. §154(d) cited in the Barnes Letter and which does not exist), states that a reasonable royalty during the time period beginning on the date of publication of the application “shall not be available under this subsection unless the invention as claimed in the patent is substantially identical to the invention as claimed in the published application.” The significant amendments to all of the claims published in the '144 Patent Application made in the Barnes USPTO Response directly negated any right to a reasonable royalty under the relevant statute.

81. For Barnes, the knowingly misleading statements and material omissions in his letter to Whiting Door likely violate Ohio Professional Conduct Rule 4.1. Ohio Prof. Cond. Rule 4.1 Cmt. 1.

82. For KNL and TTPS, on whose behalf Barnes sent the letter (although Mr. Barnes failed to disclose in the Barnes Letter to Whiting Door who he represented), the communication shows point-blank evidence of KNL and TTPS intentionally interfering with Ridge’s business relations with Whiting Door.

83. KNL and TTPS's ill motives are clear, as Whiting Door is partner of Ridge on Ridge's efforts to bring Ridge's *actually patented* (unlike the false marking of KNL and TTPS) single panel roll-up door to market.

COUNT I
INFRINGEMENT OF UNITED STATES PATENT NO. 9,151,084
AGAINST KNL, TTPS, AND TRANSGLOBAL

84. Ridge repeats and realleges every allegation contained in the above paragraphs as though fully set forth here.

85. The Cold Chain Patent is valid and enforceable.

86. Since at least the date KNL and TTPS received the KNL/TTPS Cease and Desist Letter, and the date Transglobal received the Transglobal Cease and Desist Letter, KNL, TTPS, and Transglobal have had notice of the Cold Chain Patent and Ridge's infringement allegations relating to the Cold Chain Patent.

87. Without permission or authorization from Ridge, KNL and TTPS have offered for sale, sold, and continue to offer for sale and sell the certain single panel roll-up doors, which infringe at least independent claims 1, 12, and 17 of the Cold Chain Patent, in violation of 35 U.S.C. § 271(a).

88. Transglobal has directly assisted KNL, TTPS, and Altum with manufacturing the Infringing Door, despite notice that it infringes the Cold Chain Patent.

89. More specifically, the attached Claim Chart marked as **Exhibit 16** depicts and describes how an Infringing Door and all other similarly configured single panel roll-up doors meet each and every claim limitation of the Cold Chain Patent.

90. Ridge reserves the right to modify its infringement theories as discovery progresses in this case; it shall not be estopped for infringement contention or claim construction purposes by information contained in its Claim Chart Exhibit.

91. The Claim Chart Exhibit is intended to satisfy the notice requirements of Rule 8(a)(2) of the Federal Rules of Civil Procedure and the plausibility pleading standard. The Claim Chart Exhibit does not represent Ridge's preliminary or final infringement contentions or preliminary or final claim construction positions.

92. KNL and TTPS's infringement of the Cold Chain Patent has been and continues to be willful and deliberate. Transglobal's continued infringement is also willful and deliberate.

93. The conduct of Transglobal, KNL and TTPS has caused and will continue to cause Ridge substantial damage, including irreparable harm, for which Ridge has no adequate remedy at law, unless and until Defendants are enjoined from infringing the Cold Chain Patent.

COUNT II
PATENT INDUCEMENT
AGAINST ALTUM

94. Ridge repeats and realleges every allegation contained in the preceding paragraphs as though fully set forth here.

95. KNL and TTPS directly infringed the Cold Chain Patent by offering for sale, selling, and continuing to offer for sale the Infringing Door and certain single panel roll-up doors. Transglobal has directly infringed by manufacturing the Infringing Door in concert with KNL, TTPS, and Altum.

96. Altum took active steps to induce Transglobal's, KNL's, and TTPS's infringement, including without limitation supplying KNL with a panel specifically configured and manufactured for use in making the Infringing Door and providing specific instruction to KNL about how to make the Infringing Door with Altum's panel.

97. Ridge reserves the right to modify its inducement theories as discovery progresses in this case.

98. Altum intended for KNL and TTPS to use the panels and instructions Altum supplied to make the Infringing Door and/or substantially similar single panel roll-up doors that infringe upon the Cold Chain Patent.

99. Altum knew or willfully disregarded the risk that KNL and TTPS's actions would constitute direct infringement of the Cold Chain Patent.

100. Altum received direct written notice through the Altum Cease and Desist Letter that its work with KNL and TTPS was actively inducing and contributing to infringement of the Cold Chain Patent.

101. Altum provided a response that entirely disregarded its role in inducing the infringement and participating in the ongoing infringement of the Cold Chain Patent.

102. Further coloring the intentionality and willful nature of Altum's misconduct in inducing the infringement, this represents a pattern of misconduct by Altum, which has wrongfully used other types of intellectual property that exclusively belongs to Ridge since the 3 ex-Ridge employees formed Altum in 2019.

103. Additionally, Altum was aware of Ridge's long-term research and development efforts to work on developing a single panel roll-up door. In fact, Greg Karst worked on those

development efforts back while he was an employee of Ridge, with Ridge owning all intellectual property associated with those efforts.

104. Altum has wrongly used its confidential knowledge gained while at Ridge to unfairly compete against Ridge by inducing infringement of Ridge's exclusive license to the Cold Chain Patent—and to market and attempt to sell the Infringing Door to Ridge customers.

105. It is evident that Defendants intend to continue willfully infringing the Cold Chain Patent based on Altum's defiant response in the July 10 Letter, as well as that of KNL/TTPS through the Barnes Letter—which misleadingly threatens Ridge's business associate with possible liability for royalty damages based on KNL's pending '144 Patent Application.

COUNT III
CONTRIBUTORY INFRINGEMENT
AGAINST ALTUM

106. Ridge repeats and realleges every allegation contained in the preceding paragraphs as though fully set forth here.

107. Altum knew that the panel it supplies to KNL is a key component of the Infringing Door that is material to practicing the invention claimed in the Cold Chain Patent and that the panel is not a staple article of commerce suitable for substantial non-infringing uses.

108. Altum knew that the panel was selectively made and specifically supplied for use in the Infringing Door and knowing the same to be infringing.

109. KNL and/or TTPS use the Infringing Door to directly infringe the Cold Chain Patent.

COUNT IV
TORTIOUS INTERFERENCE WITH BUSINESS RELATIONSHIPS
AGAINST KNL, TTPS, AND ALTUM

110. Ridge repeats and realleges each and every allegation contained in the preceding paragraphs as though fully set forth here.

111. Ridge has established advantageous business relationships with, and prospective economic advantage as to, each of its customers and with its business partners with whom Ridge is partnering to manufacture and sell the Ridge Door.

112. KNL, TTPS, and Altum had knowledge of Ridge's established advantageous business relationships.

113. KNL, TTPS, and Altum have intentionally interfered and are continuing to interfere with one or more of Ridge's business relationships with its customers by offering for sale and selling the Infringing Door.

114. KNL and TTPS have interfered with Ridge's business relationship with Ridge's partners in manufacturing and selling the door by making misleading threats to Ridge's business partners, including the Barnes Letter to Whiting Door.

115. Ridge has been damaged by KNL and Altum's wrongful conduct and actions, as of the filing of this Complaint, in an aggregate amount to be determined at trial.

COUNT V
FALSE MARKING, A VIOLATION OF 35 U.S.C. § 292
AGAINST TTPS AND KNL

116. Ridge repeats and realleges every allegation contained in the preceding paragraphs as though fully set forth here.

117. TTPS, in coordination with KNL, has marked the unpatented Infringing Door as being patented in multiple places on TTPS's website. (**Ex. 8.**).

118. TTPS has acted with the intent to deceive the public by marking the Infringing Door as patented. This intent is a more than reasonable inference since the false marking has remained on the TTPS website following the KNL/TTPS Cease and Desist Letter that KNL and TTPS received in June of 2023.

119. As a result of KNL and TTPS's conduct, Ridge's ability to compete against TTPS, KNL, and Altum in the narrow, niche market for purchasing and implementing the lightweight single panel roll-up doors into fleets of commercial vehicles has been, and continues to be seriously harmed, resulting in tangible economic loss to Ridge and the imminent threat of continuously greater loss to Ridge unless and until the false marking and all sales of the Infringing Doors are immediately enjoined.

120. Ridge has suffered a competitive injury in an aggregate amount to be determined at trial.

REQUEST FOR RELIEF

WHEREFORE, Ridge prays for judgment as follows:

- A. For a judgment that Defendants have infringed the Cold Chain Patent;
- B. For an order preliminarily and permanently enjoining Defendants and their officers, directors, agents, employees, affiliates, successors, and all persons in privity or active concert or participation with Defendants, directly or indirectly, from infringing the Cold Chain Patent and from false marking of the Infringing Door as being patented;
- C. For a judgment and award that Defendants account for and pay to Ridge damages adequate to compensate for Defendants' infringement of the Cold Chain Patent, including lost profits but in no event less than a reasonable royalty for each asserted utility patent and total profits for each asserted design patent pursuant to 35 U.S.C. §289;

D. For a judgment and award of any supplemental damages sustained by Ridge for any continuing post-verdict infringement of the Cold Chain Patent until entry of final judgment with an accounting as needed;

E. For a finding that Defendants' infringement is willful and an award of increased damages for willful infringement pursuant to 35 U.S.C. §284;

F. For an order finding that this case is exceptional under 35 U.S.C. §285 and awarding Ridge its costs, expenses, and disbursements incurred in this action, including reasonable attorneys' fees as available by law to be paid by Defendants;

G. For an award of damages from Defendants for any loss occasioned by Defendants' tortious interference with Ridge's business relationships with its customers, in an amount to be determined at trial;

H. For an award of damages from Defendants for any competitive injury occasioned by Defendants' false marking, in an amount to be determined at trial;

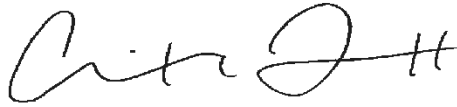
I. For an award of pre-judgment interest, post-judgment interest, and costs in this action;

J. For an award of such other relief as this Court deems just and proper.

JURY DEMAND

Ridge demands a jury trial on all issues so triable.

Respectfully submitted,



Dated: September 20, 2023

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Counsel for Plaintiff Ridge Corporation

VERIFICATION

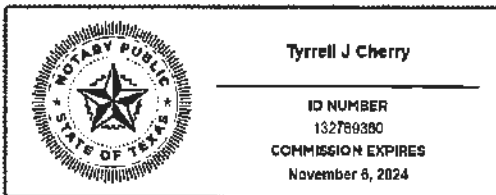
I, Mr. Raymond McDonald, being first duly sworn, state that I have reviewed the allegations of the above Verified Complaint of Ridge Corporation and swear that the factual allegations contained in the Verified Complaint are true and accurate to the best of my knowledge, information, and belief.

Raymond A McDonald

By: Mr. Raymond McDonald, Jr.
Chief Operating Officer
Ridge Corporation

State of Texas | County of Brazoria

SWORN TO and subscribed before me this 19th day of September 2023.



TJ Cherry
Notary Public
My commission expires: 11/06/2024

Notarized online using audio-video communication

Exhibit No.	Description
1.	United States Patent No. 9,151,084 (“Cold Chain Patent”)
2.	Cold Chain License Agreement dated February 15, 2023
3.	Cold Chain Amended and Restated License Agreement dated May 1, 2023
4.	United States Patent Application 17/676,144 (“‘144 Patent Application”)
5.	June 6, 2023 Letter to KNL re: Inventorship of the ‘144 Patent Application
6.	June 30, 2023 Email from KNL to Ridge re: Inventorship of the ‘144 Patent Application
7.	July 2, 2023 Email from Ridge to KNL Providing Evidence of Ridge’s Inventorship of the ‘144 Patent Application
8.	TTPS Website Screenshots
9.	Ridge’s June 6 Cease and Desist Letter to KNL and TTPS
10.	KNL and TTPS’s July 5 Response Acknowledging Receipt of June 6 Cease and Desist Letter
11.	KNL and TTPS’s August 1, 2023 Response to June 6 Cease and Desist Letter Denying Infringement Allegations
12.	Ridge’s June 9, 2023 Cease and Desist Letter to Altum
13.	Altum July 10, 2023 Response to Cease and Desist Letter Denying Any Infringement
14.	Barnes’s September 6, 2023 Letter to Ridge’s Partner, Whiting Door
15.	Barnes’s September 11, 2023 Response to the USPTO Amending the ‘144 Patent Application
16.	Claim Chart
17.	Ridge’s June 27, 2023 Cease and Desist Letter to Transglobal

EXHIBIT 1



US009151084B2

(12) **United States Patent**
Wachtell et al.

(10) **Patent No.:** **US 9,151,084 B2**
(45) **Date of Patent:** **Oct. 6, 2015**

(54) **INSULATED OVERHEAD DOOR**

(56) **References Cited**

(75) Inventors: **Peter J. Wachtell**, Boise, ID (US);
Daniel M. Aragon, Meridian, ID (US);
John J. Prehn, Boise, ID (US); **Todd J. Lindsey**, Boise, ID (US)

U.S. PATENT DOCUMENTS

(73) Assignee: **COLD CHAIN, LLC**, Boise, ID (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 63 days.

(21) Appl. No.: **13/585,994**

(22) Filed: **Aug. 15, 2012**

(65) **Prior Publication Data**

US 2013/0042983 A1 Feb. 21, 2013

Related U.S. Application Data

(60) Provisional application No. 61/523,786, filed on Aug. 15, 2011.

(51) **Int. Cl.**

E05D 15/16 (2006.01)

E05B 81/10 (2014.01)

F25D 23/02 (2006.01)

E06B 3/80 (2006.01)

(52) **U.S. Cl.**

CPC **E05B 81/10** (2013.01); **E05D 15/16** (2013.01); **E06B 3/80** (2013.01); **F25D 23/021** (2013.01); **Y10T 292/11** (2015.04)

(58) **Field of Classification Search**

USPC 160/201, 230, 231.1, 231.2, 232, 23.1, 160/270, 271, DIG. 8; 296/146.8

IPC F25D 23/021; E05D 15/20; E06B 3/80, 2003/7044, 2003/7049, 2003/7051, E06B 2003/7053

See application file for complete search history.

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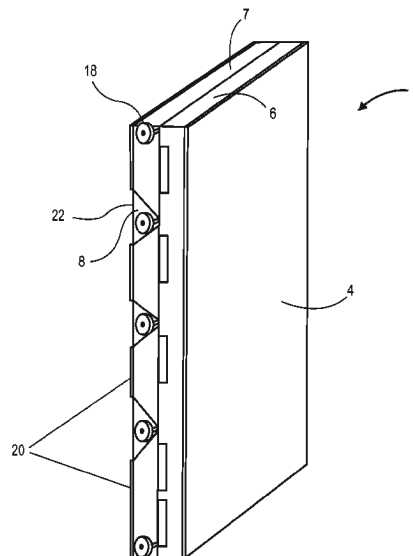
Primary Examiner — David Purol

(74) *Attorney, Agent, or Firm* — MH2 Technology Law Group, LLP

(57) **ABSTRACT**

An article of manufacture for use as an insulated overhead door that is designed to roll open and closed in tracks, with a sheet of thermoplastic material that acts as the outer door membrane and barrier to entry, a sheet of insulating material that acts as a base insulating barrier adhered to the thermoplastic membrane.

19 Claims, 2 Drawing Sheets



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Sheet 1 of 2

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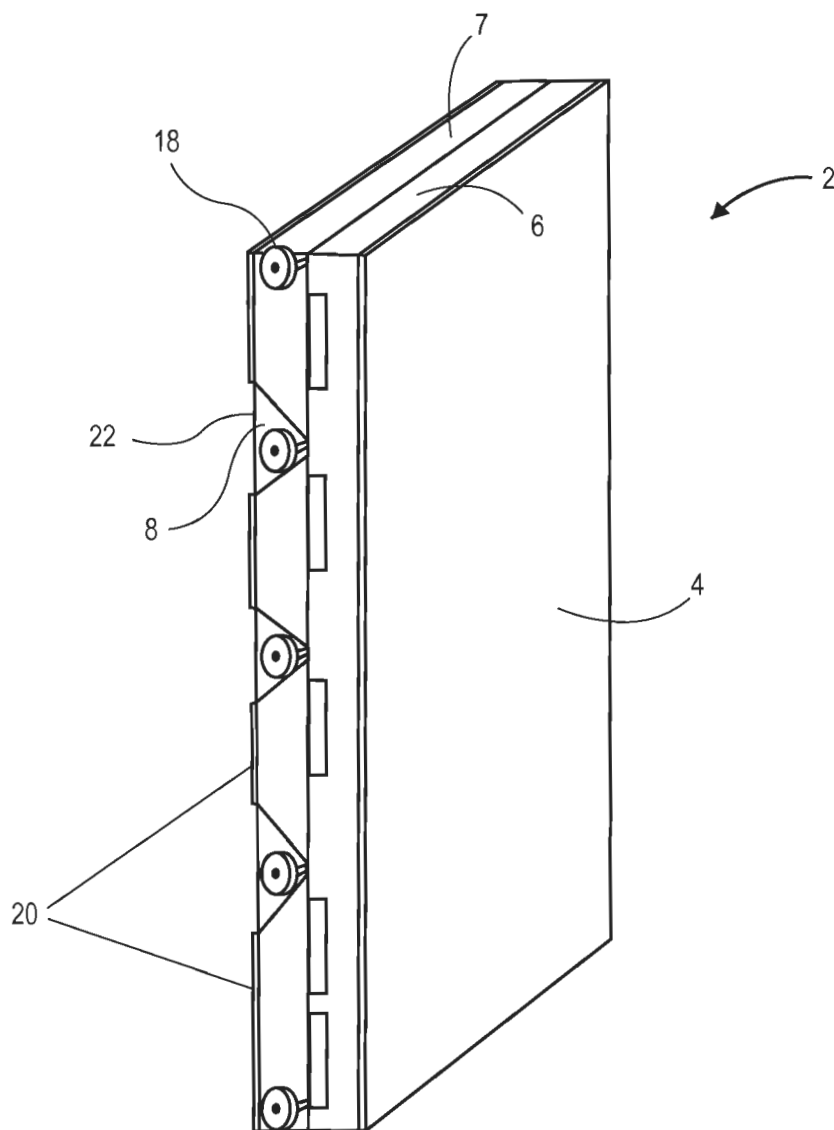


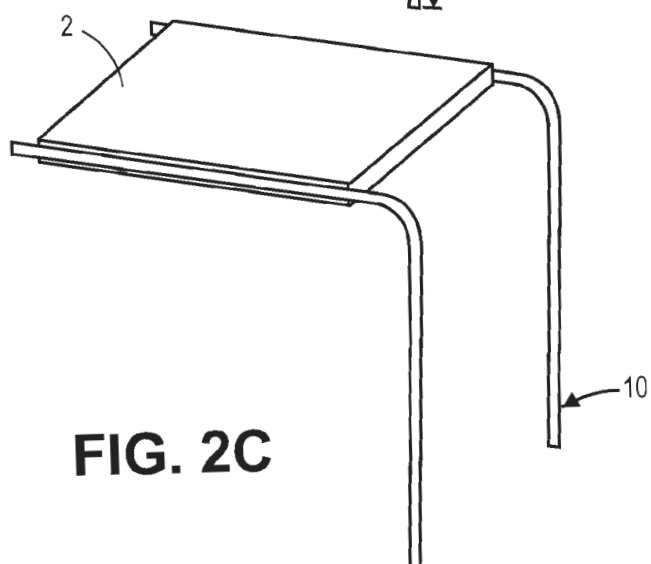
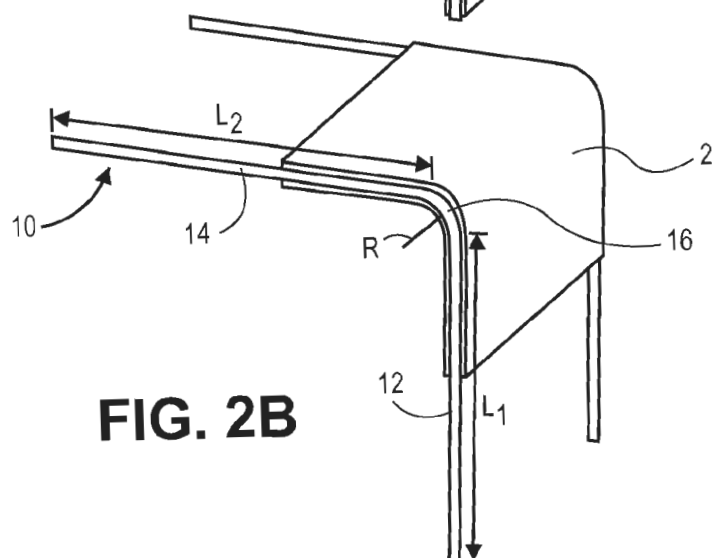
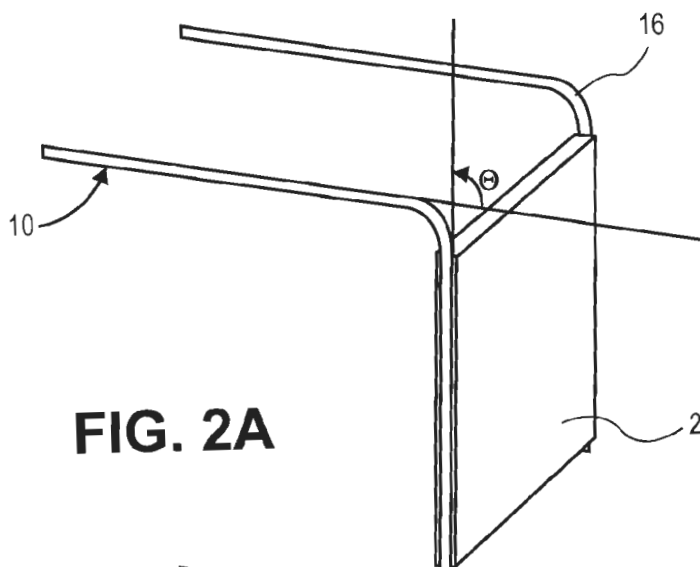
FIG. 1

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Sheet 2 of 2

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INSULATED OVERHEAD DOOR

This application claims benefit of U.S. Provisional Application No. 61/523,786, filed Aug. 15, 2011, the disclosure of which is hereby incorporated by reference in its entirety.

BACKGROUND

This invention relates generally to the field of overhead insulated doors and, more specifically, to an insulated overhead door that is designed to roll open and closed in tracks.

In the cold storage distribution industry, insulated doors of various types are used to cover openings between cold areas and warm areas. Depending upon the locations and use of the opening, the doors may be opened multiple times each day, which can result in increased energy costs for maintaining desired temperatures of cold storage containers. Over time, the industry has developed and used doors with increasing insulating qualities (R-value) and with door opening assistance mechanisms (springs and counter weights) that allow for the door to be quickly opened and closed. The speed with which a door can be opened and closed is important as the more that the door can be kept closed, the more energy is saved from having to cool the cold side of the door, and the better the condition of the material that is being kept cool.

With regard to refrigerated trucks, most outer doors that are used for loading and unloading the interior truck space are made of a series of hinged horizontal metal panels filled with insulating foam material. These sections are hinged together to form a single flexible door unit that is sized to fit the opening to be covered. This single unit with several hinged sections is designed to slide up and down in tracks, with the hinged sections allowing the door to bend such that it can slide up and around a curved track path and be suspended in the tracks directly overhead from the refrigerated interior of the truck.

The current state of insulated overhead truck doors is such that they are heavy (e.g., 500+ lbs.), have a lower R-value than that desired by the shippers, and can require large numbers of hinges and other hardware for their construction. There can be significant costs associated with the regular servicing and maintenance of the hinge hardware. In addition to these drawbacks, because the current doors are made up of several separate panels held together by hinges, painting the truck door or applying the company logos or other advertisements to the back panel of the door can be complicated and expensive due, in part, to the need to align the message across multiple panels so as to be readable when door is in the closed position. If a single panel of the door is damaged and requires replacement, the entire door may need to be cleaned and repainted. Further, the doors often employ complicated gaskets in an attempt to provide an improved seal between each of the panel sections. Even then, the multiple horizontal panel design reduces the thermal performance of the entire door.

Due to the heavy nature of most existing overhead doors, large assistance springs or counter weights are often fitted to the door to enable a driver to open and close the door. The springs and/or counter weights increase the total cost and complicate installation of the doors on the truck. In addition, due to the weight of the door, automated systems for opening and closing these doors have not been commercially successful because they are generally considered to be too slow to be useful.

SUMMARY

One or more of the following advantages may be realized by the doors of the present disclosure: a door with a higher

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R-value for openings designed to utilize an overhead door that runs on tracks; elimination of horizontal seams in the door that result in air leaks and heat intrusion and cause a reduction of the overall thermal performance of the door; providing an improved, seam free door surface for affixing decals, logos or advertising information; providing a simpler door with fewer parts used for its manufacture than many existing doors and a reduction of maintenance costs; reducing the weight of the door to allow a trailer to carry increased amounts of freight; and providing a door that easily utilizes existing overhead track technologies.

The present disclosure addresses some of the current problems with existing overhead door technology, and in particular, the problems associated with insulated doors used in the cold storage industry, such as on delivery trucks for cold storage distribution. By looking at the existing materials that are used in the current door technology, it was determined that finding a lighter weight solution would be advantageous, and that new closed cell foam insulation material existed that could provide a higher R-value with less weight than existing door panels. In attempting to construct a lighter weight version of an operating door, it was apparent that the hinged door design dictated that the door be cut into discreet sections that could be hinged together so as to allow the door to open and close by traversing along curved tracks, thereby positioning the door out of the way of the driver for loading and unloading the truck.

The inventors of the present disclosure realized that if suitable materials are used, single panel overhead doors can be made that are sufficiently flexible to open and close in curved tracks, as described in detail herein. This would allow for overhead doors having one or more advantages, such as higher R-value for insulation, reduced heat intrusion into a cooled space and reduced weight or elimination of springs and counterweights. Other advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

An embodiment of the present disclosure is directed to an insulated overhead door that is designed to roll open and closed in tracks. The overhead door comprises a thermoplastic membrane. A sheet of insulating material is attached to the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel. Wheels are attached to the door allowing the door to fit into tracks to guide the opening and closing of the door. The overhead door comprises only a single panel.

Another embodiment of the present disclosure is directed to an overhead door assembly. The overhead door assembly comprises a set of curved tracks. An insulated overhead door is configured to roll open and closed in the tracks. The overhead door comprises a thermoplastic membrane. A sheet of insulating material is attached to the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel. Wheels are attached to the door allowing the door to fit into tracks to guide the opening and closing of the door. The overhead door comprises only a single panel.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

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FIG. 1 is a perspective view of an insulated door, according to an embodiment of the present disclosure.

FIGS. 2A to 2C illustrate an insulated door at different positions on a track, according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that various changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense.

Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

In accordance with an embodiment of the disclosure, there is disclosed an article of manufacture for use as an insulated overhead door that is designed to roll open and closed in curved tracks. The door comprises for example, a single sheet of thermoplastic material that acts as the outer door membrane and barrier to entry. The overhead door can also include a single sheet or multiple sheets of material that can act as a base insulating barrier. The door can also include suitable hardware for allowing the door to fit into tracks so as to guide the opening and closing of the door. For example, the door can comprise blocks to which wheels with bearings may be affixed.

FIG. 1 illustrates an overhead door 2, according to an embodiment of the present disclosure. A thermoplastic membrane 4 can be affixed to an insulating material 6 in any suitable manner so as to form a single panel capable of flexing as it traverses curved tracks. For example, the thermoplastic membrane 4 can be cut or otherwise formed to be approximately the size of the opening to be covered. Insulating material 6 can be affixed to thermoplastic membrane 4 using an adhesive or other fastener. In an embodiment, the fastener can be suitable for cold temperature performance. Suitable techniques for affixing the insulating material to the thermoplastic membrane 4 are well known in the art.

In another embodiment, the thermoplastic membrane 4 can be applied to the insulating material 6 in a liquid form, such as by spraying or coating in any suitable manner. The thermoplastic membrane 4 can then be dried or cured on the insulating material 6. The Insulating material 6 can be cut to size either before or after the thermoplastic membrane 4 is applied.

In an embodiment, the thermoplastic membrane 4 comprises a flexible, durable polymeric material that will protect the insulating material 6 from physical damage and from the elements, including moisture. It can also include other materials, such as fiber glass, to strengthen and/or provide the desired flexibility versus stiffness or other desired properties. Examples of suitable thermoplastic membrane materials include, for example, polypropylene impregnated with glass fibers and laminated together to create a directional structure, such as VERSATEX® VX or VERSATEX VR, both available

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from US Liner based in Cranberry Township, Pa. Other examples of suitable thermoplastic membrane material include poly vinyl chloride (PVC) combined with rubberizing agents to increase flexibility, which are well known in the art; or polyurea and/or polyurethane applied directly to the foam or any other acceptable substrate, such as the spray on liners available from LINE X Protective Coatings of Huntsville, Ala., or Rhino Linings Corporation of San Diego, Calif.

Examples of insulating materials include foam. Suitable foams can include, for example, closed cell foams, such as ethylene vinyl acetate ("EVA") foam, which is a copolymer of ethylene and vinyl acetate and is available from many sources. The weight percent vinyl acetate may vary, for example, from about 10% to about 40%, based on the total weight of the EVA material, with the remainder being ethylene. Other examples of suitable closed cell foams include polyethylene foams, polypropylene foams or neoprene based foams. Open cell foams, such as polyether based polyurethanes foams or polyester based polyurethane foams, can also be used. All of these listed foams are generally well known in the art.

In an embodiment, solid blocks or any other suitable hardware may be attached to the thermoplastic membrane to allow for the attachment of wheels 18 (which may or may not include bearings), such that the door may be run in overhead door tracks.

In an embodiment, foam blocks 7, as illustrated in FIG. 1, (such as EVA foam or any other insulating material, including any foam discussed herein) may be adhered to, for example, an initial sheet of foam, such as closed cell foam, that is employed as insulating material 6. In this manner, a door with an increased R-value may be provided. The insulating foam can be bonded together in any suitable manner. Techniques for bonding insulating foam together, such as with adhesives, are well known in the art.

The insulating foam can optionally include compression gaps 8, examples of which are shown in FIG. 1. The compression gaps 8 in the foam material allow the foam to more easily bend during the opening and closing of the door. The compression gaps 8 can be formed between the foam blocks, as illustrated. Alternatively, the compression gaps 8 can be formed partially through a foam sheet, such as where a second foam sheet is used to replace some or all of the foam blocks bonded to the first foam sheet shown in FIG. 1. In yet another embodiment, compression gaps 8 could be formed in the foam sheet illustrated in FIG. 1.

Due to the flexibility of the thermoplastic membrane 4 and foam composite, the doors of the present disclosure can be made as a single integral unit, or panel, that is approximately the size of the door opening, without having to hinge together multiple sections to allow the door to traverse a curved track. In an embodiment, the single laminate door section can flex sufficiently to traverse an existing track. FIGS. 2A to 2B illustrate a door 2 flexing to traverse tracks 10, according to an embodiment of the present disclosure. The tracks 10 can be attached to, for example, a truck or enclosed trailer used for cold storage during transport. Alternatively, the tracks 10 can be attached to a building for which thermally insulated doors are desired, such as might be used for cold storage on a walk-in freezer or refrigerated warehouse, or a garage door.

The tracks 10 comprises a track portion 12 of a first length, L_1 , positioned at an angle, Θ , relative to track portion 14 of a second length, L_2 , as shown in FIG. 2A. Θ can range, for example, from about 80° to about 125°. In an embodiment, Θ is approximately 90°. In an embodiment, the door is positioned substantially horizontally from a point near the top of the door opening, so that most or all of the door is in a

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substantially vertical position when closed and most or all of the door is in a substantially horizontal position when open (assuming the truck or refrigerated container the tracks **10** are attached to is positioned on a substantially level surface).

In embodiments, the track portions **12** and **14** can be relatively straight. In alternative embodiments, the track portions **12** and **14** can be somewhat curved.

A third curved track portion **16** connects the first portion **12** and second portion **14**. Curved track portion **16** can be curved in any suitable manner that will provide the transition between the relative angles of track portion **12** and track portion **14**. The door **2** is designed so that it is capable of flexing to traverse the curved track portion **16**. In an embodiment, the portion of door **2** traversing the curve track portion **16** will generally curve to approximate the curved shape of the curved track portion **16**. For example, all or a part of track portion **16** can be curved in a circular arc so that the inner path contacted by the wheels has a radius of curvature, R (illustrated in FIG. 2B), where R can range, for example, from about 1 inch to about 25 inches, such as about 5 inches to about 18 inches.

The density of the closed cell foam combined with the thermoplastic liner thickness provides enough stiffness to create a good seal around the edge of the door when the panel is in the closed position, yet may be flexible enough to bend across the horizontal dimension up to, for example, approximately 90 degrees when running through the curved portion of the tracks **10**. The flexibility may be increased or decreased by modifying the densities and thicknesses of the foam and liners that are combined such that the panel is able to flex over a very tight radius or a longer radius track curve as a particular door opening and track curvature dictates.

The wheels **18** can be affixed to the door in any suitable manner so that the wheels **18** are positioned to fit into the tracks **10**. There are many ways to attach the wheels to the door. For example, the wheels **18** can be mounted using blocks, as discussed above, or brackets. Wheels with sleeves might also be employed to attach the wheels **18** to the door, as is well known in the art.

An optional flexible membrane **20** can also be employed, as illustrated in FIG. 1. The flexible membrane **20** can be made of any suitable flexible material, such as cloth, plastic or rubber sheeting. Optional flexible covers **22** can be employed at the hinge locations, if desired, as is also illustrated in FIG. 1. The flexible covers **22** can also be made of any suitable flexible material, such as those listed for the flexible membrane **20**. In an alternative embodiment, the flexible membrane **20** and flexible covers **22** can be a single integral piece of flexible material.

The door can be any desired size or shape. Example door sizes can range from about 6 feet to about 10 feet in width, and about 6 feet to about 12 feet in height. The thickness of the door can be fashioned up to, for example, 12 inches in thickness. Example R values for the door can range from about 14 to about 50. The R value can be increased by increasing the thickness of the door and the amount of EVA foam that is used.

In an embodiment, the door is relatively light weight, so that it can easily be opened and closed by a manual process, or by use of an automatic system, such as, for example, electric, hydraulic or pneumatic systems. These systems can be made to be very efficient at quickly opening and closing doors that are lightweight. Furthermore, the use of these systems may allow the door's opening trigger to be manual or to be automatic based upon the approach of the driver carrying, for example, an RFID transmitter (not shown).

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Other alterations or changes to the design of the embodiment of FIG. 1 can also be made. For example, rather than employing insulating foam blocks, as illustrated in FIG. 1, the insulating foam sheet can be employed without the foam blocks, in combination with the sheet of thermoplastic material. Further, the location and number of wheels **18** can also be changed. Still other alterations can be made, as would readily be understood by one of ordinary skill in the art.

While the invention has been described in connection with various detailed embodiments, the description is not intended to limit the scope of the invention to the particular forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom, the insulated overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface, a top surface, a bottom surface, a first side surface and a second side surface, both the first outermost surface and the second outermost surface being larger than any of the top surface, bottom surface, first side surface and second side surface, the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the thermoplastic membrane forming the first outermost surface of the door;

a sheet of foam insulating material directly attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the foam insulating material forming the second outermost surface of the door; and

wheels attached to the door allowing the door to fit into tracks to guide the opening and closing of the door,

wherein the overhead door comprises only one of the panel, the panel being flexible along the entire length of the panel so as to be capable of approximating the curvature of curved tracks having a radius of curvature ranging from about 5 inches to about 25 inches, where the track has a first length positioned at an angle, Θ , relative to a track portion of a second length, wherein Θ ranges from about 80° to about 125°.

2. The insulated overhead door of claim 1, wherein the thermoplastic membrane is a single sheet.

3. The insulated overhead door of claim 1, wherein the thermoplastic membrane comprises polypropylene impregnated with glass fibers.

4. The insulated overhead door of claim 1, wherein the insulating foam comprises compression gaps configured to allow the foam to more easily bend during opening and closing of the door.

5. The insulated overhead door of claim 1, wherein the insulating material is closed cell foam.

6. The insulated overhead door of claim 5, wherein the closed cell foam comprises ethylene vinyl acetate.

7. The insulated overhead door of claim 5, wherein the closed cell foams is chosen from polyethylene foams, polypropylene foams or neoprene based foams.

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8. The insulated overhead door of claim 1, wherein the insulating material is an open cell foam.

9. The insulated overhead door of claim 1, further comprising an additional membrane that is not the thermoplastic membrane.

10. The insulated overhead door of claim 1, the door having an R value ranging from about 14 to about 50.

11. A method comprising:

providing the insulated overhead door of claim 1 on tracks, at least a portion of the tracks being curved; and moving the insulated overhead door so that a portion of the thermoplastic membrane and a portion of the insulating material flex to allow the door to traverse the curved portion of the tracks.

12. An overhead door assembly comprising:

a set of curved tracks; and

an insulated overhead door configured to roll open and closed in the tracks to cover a door opening having a top and a bottom, the overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface, a top surface, a bottom surface, a first side surface and a second side surface, both the first outermost surface and the second outermost surface being larger than any of the top surface, bottom surface, first side surface and second side surface, the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening when the door is in a closed position, the thermoplastic membrane forming the first outermost surface of the door;

a sheet of foam insulating material directly attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the foam insulating material forming the second outermost surface of the door; and

wheels attached to the door allowing the door to fit into tracks to guide the opening and closing of the door, wherein the overhead door comprises only one of the panel, the panel being flexible along the entire length of the panel so as to be capable of approximating the curvature of curved tracks having a radius of curvature ranging from about 5 inches to about 25 inches, where the track has a first length positioned at an angle, Θ , relative to a track portion of a second length, wherein Θ ranges from about 80° to about 125°.

13. A truck comprising the insulated overhead door assembly of claim 12.

14. A cold storage trailer comprising the insulated overhead door assembly of claim 12.

15. A building comprising the insulated overhead door assembly of claim 12.

16. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom, the insulating overhead door consisting of:

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a flexible thermoplastic membrane having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the flexible thermoplastic membrane comprising polypropylene impregnated with glass fibers;

a sheet of flexible foam insulating material attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side; and

wheels attached to the door with wheel attachment hardware, the wheels allowing the door to fit into tracks to guide the opening and closing of the door,

wherein the panel is flexible along the entire length of the panel so that the overhead door is capable of traversing tracks of varying radii of curvature ranging from about 5 inches to about 25 inches, where the track portion has a first length positioned at an angle, Θ , relative to a track portion of a second length, wherein Θ ranges from about 80° to about 125°.

17. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom, the insulating overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface, a top surface, a bottom surface, a first side surface and a second side surface, both the first outermost surface and the second outermost surface being larger than any of the top surface, bottom surface, first side surface and second side surface, the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the thermoplastic membrane forming the first outermost surface of the door;

a foam insulating material attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the foam insulating material forming the second outermost surface of the door; and wheels attached to the door allowing the door to fit into tracks to guide the opening and closing of the door, wherein the overhead door comprises only one of the panel, the panel being sufficiently flexible to traverse curved tracks.

18. The insulated overhead door of claim 17, wherein the foam insulating material comprises foam blocks configured to increased an R-value of the door.

19. The insulated overhead door of claim 17, wherein the panel is sufficiently flexible so that the overhead door is capable of traversing tracks of varying radii of curvature ranging from about 5 inches to about 25 inches.

* * * * *

EXHIBIT 2

LICENSE AGREEMENT

THIS AGREEMENT is made and entered into as of the 15th day of February, 2023 (the “Effective Date”), by and between COLD CHAIN, LLC, a Delaware limited liability company (the “Licensor”) and RIDGE CORPORATION, an Ohio corporation (the “Licensee”).

The parties hereby agree as follows:

1. Defined Terms. As used in this Agreement, the following defined terms shall have the following respective meanings:
 - a. Affiliate. “Affiliate” shall mean with respect to a party, any Person that, directly or indirectly, is controlled by, controls, or is under common control with such party, only while such control exists.
 - b. Confidential Information. “Confidential Information” shall mean: any and all technical or business data, information or items (including third party data, information, or items) in whatever form or medium, of one party provided to or obtained by the other party or accessed by the other party pursuant to this Agreement regardless of whether such data, information or items are marked or identified as “Confidential”.
 - c. Licensed Patent. “Licensed Patent(s)” shall mean those certain patents legally described as U.S. 10,066,434 (application S/N 14,875,577) titled INSULATED OVERHEAD DOOR, filed on October 5, 2015 claiming priority to U.S. 9,151,084, and U.S. 9,151,084 (application S/N 13/585,944) titled INSULATED OVERHEAD DOOR, filed on August 15, 2012 claiming the benefit of U.S. Provisional Application 61/523,786 filed on August 15, 2011 including all future, pending, expired counterparts (domestic and foreign) related to the foregoing patents and/or technological scope.
 - d. Licensed Product. “Licensed Product” or “Licensed Products” shall mean a truck roll-up door, trailer roll-up door or other roll-up door application that includes every limitation of at least one valid and enforceable claim of the Licensed Patent(s) and manufactured, used, imported, offered for sale or sold by the Licensee.
 - e. Net Sales Price. “Net Sales Price” shall mean the amount actually received by the Licensee for each Licensed Product, including adjustments for all discounts and deductions allowed by Licensee to purchaser, less all freight costs, sales, excise, value added or similar taxes and less any returns and allowances in respect of Licensed Products all as actually incurred or paid by Licensee. In the event that a Licensed Product is sold by Licensee to any Affiliate of Licensee or sold in combination with another product, then the Net Sales Price with respect to such sales will be the greater of either (i) the above definition of Net Sales Price (as applied to sales of such product to the Affiliate, if applicable), or (ii) the average Net Sales Price of all Licensed Products sold by Licensee to all non-Affiliates during the calendar quarter in which such sale was made.

- f. Licensed Patent Challenge. “Licensed Patent Challenge” shall mean Licensee or its Affiliates, directly (e.g., by itself) or indirectly (e.g., through a “straw man,” or other involvement for or with a third party, or otherwise), challenging the scope, validity, enforceability, ownership, or inventorship of the Licensed Patent, whether pursuant to a court action, reexamination, opposition or patent office proceeding. However, “Licensed Patent Challenge” shall not include compliance with subpoenas or other court orders, provided that (and to the extent): (i) Licensee and its Affiliates have not directly or indirectly encouraged or acquiesced to the issuance of such order or subpoena; and (ii) Licensee and its Affiliates have given Licensor prompt notice of such order or subpoena, and reasonably cooperate with Licensor to challenge and/or limit the scope of such subpoena or court order with respect to any response thereto.
 - g. Person. “Person” shall mean any individual, corporation, limited liability company, partnership, joint venture, trust, business, association or other entity.
 - h. Territory. “Territory” shall mean the United States of America and all foreign countries.
- 2. Term and Termination. The initial term of this Agreement shall begin on the Effective Date and shall continue for a period of five (5) years thereafter. Notwithstanding the stated term hereof, either party may terminate this Agreement in the event of a material breach hereof by the other party provided that (i) the terminating party notifies the other party in writing of the specific nature of such material breach, and (ii) the other party fails to correct the same within twenty-one (21) days after receipt of such notice (or such additional time as reasonably necessary to cure the breach so long as the other party diligently pursues the cure to completion).
- 3. Grant of License. Licensor hereby grants to Licensee an exclusive, royalty bearing, non-transferable right and license to make, have made, use, sell, install, service, import/export and/or otherwise commercialize Licensed Products in the Territory (the “License”). Except as to an Affiliate, Licensee shall not have the right to sublicense the forgoing rights. Except for the licenses granted to Licensee in this Section, Licensor hereby expressly retains all rights, title and interest in and to all Licensed Patents and Licensor’s other intellectual property; and, no other rights are or shall be deemed to be granted to Licensee by implication, estoppel, statute, operation of law or otherwise pursuant to this Agreement.
- 4. Survival. The following Sections shall survive the expiration or termination of this Agreement: 6 (with respect to any amounts owed prior to termination or expiration), 7 (with respect to any amounts owed prior to termination or expiration), 8 (pursuant to its terms), 13, 14 (with respect to any action commenced prior to expiration or termination), 17, 21, 22, 23, 25, 26, 28, 29 and 31.
- 5. Disposal Upon Expiration. Upon expiration or termination of this Agreement, Licensee shall have the right, pursuant to the provisions hereof, for a period of one hundred and eighty (180) days, to dispose of all unsold Licensed Products manufactured by it or in the

process of manufacture at the time of expiration or termination; provided that Licensee makes timely payment to Licensor of all Royalties due on such Licensed Products.

6. Royalties. During the term hereof, Licensee shall pay royalties (“Royalty” or “Royalties”) to Licensor as follows:
 - a. Royalty Percentage. Subject to Section 11, Licensee shall pay to Licensor a Royalty in the amount of five percent (5%) of the Net Sales Price of all Licensed Products which are sold, by Licensee in the Territory; provided, however, that no such Royalties shall apply to and/or accrue for the first two (2) years of the term of this Agreement as additional consideration for Licensee’s best efforts to commercialize the Licensed Patent.
 - b. Licensed Patent Challenge. Notwithstanding the above, to the extent the following is enforceable under applicable law, if Licensee or any of its Affiliates or agents directly or indirectly bring or initiate a Licensed Patent Challenge during the term of this Agreement, Licensee shall pay Royalties to Licensor (while such Licensed Patent Challenge continues) at the rate of fifteen percent (15%) on all Licensed Products which are made, sold, offered for sale, imported or used by Licensee in the Territory.
 - c. Currency. Licensee shall make all payments of Royalties in U.S. dollars by wire transfer to the account Licensor designates in writing to Licensee from time to time, without deduction for bank wire or other charges (which charges will be paid by Licensee). For any sales that are conducted in a foreign currency, Licensee shall provide currency conversion information showing the foreign currency and the conversion to U.S. Dollars using the exchange rate for the fifteenth (15th) day of the relevant month in which the sale occurred (or the next business day if such day falls on a weekend or a holiday) as set forth in the U.S. edition of *The Wall Street Journal*.
 - d. Late Payment. If any payment of Royalties is delayed more than fifteen (15) days after the due date (as set forth in Section 7, below), and if such deficiency is not cured within fourteen (14) business days after receipt by Licensee of written notice thereof from Licensor, then Licensee shall pay interest on the unpaid Royalty amount from and after the date on which the same became due at a rate of one and a half percent (1.5%), compounded monthly, or the maximum amount allowed by law, whichever is less. In the event that any collection action is initiated, the prevailing party shall be entitled to recover its attorneys’ fees and other costs of bringing or defending such action.
 - e. Patent Exhaustion. Each Licensed Product on which Licensee has paid a Royalty hereunder may be subsequently installed, serviced, used, licensed and re-sold by each subsequent owner thereof without any further Royalty obligation to Licensor with respect to the Licensed Patent(s).

- f. Taxes. Each party shall be solely responsible for its own taxes, charges, expenses and duties incurred in connection with the sale of Products and any payment of Royalties.
7. Royalty Payments and Reports. On or before the last day of the month following the end of each calendar quarter, Licensee shall pay to Licensor the Royalties for such quarter. Each Royalty payment shall be accompanied by a statement of the number of Licensed Products sold by Licensee during such quarter, in units and dollars, and Licensee's calculation of the Royalty due thereupon, including any currency conversion information.
8. Audit Rights. At all times during this Agreement and for two (2) years following its termination or expiration, Licensee shall make all relevant documents, reports and books of account which contain information reasonably related to the amount of Royalties due hereunder available to Licensor and Licensor's public accounting firm for inspection, audit and copying during normal business hours, upon not less than five (5) business days advance notice, which will be made by Licensor at its own expense, except as provided below. Licensee shall also make reasonably available qualified employees and agents to answer all questions pertaining to such audit. If the audit reveals that there is an underpayment error in excess of the greater of US \$5,000 or twenty percent (20%) of the Royalties which would have been properly payable in any calendar quarter, then without prejudice to any other amounts due to Licensor or to any of its rights hereunder, all third party reasonable costs and expenses paid by Licensor in connection with such audit shall be borne and promptly paid by Licensee. Licensee shall have the right to require that Licensor's public accounting firm sign a reasonable Confidentiality Agreement prior to any audit limiting its disclosure of Licensee's financial information only to Licensor and only to such information as reasonably relates to compliance with this Agreement.
9. Exclusivity. The License granted to Licensee hereunder shall be exclusive through the term of this Agreement.
10. Commercialization. Licensee acknowledges and agrees that part of the consideration for Licensor's grant of the License herein is Licensee's best efforts to commercialize the Licensed Patent. Accordingly, Licensor shall have the right to terminate this Agreement, upon ten (10) days written notice, if Licensee fails to use Commercially Reasonable Best Efforts (as defined below) to manufacture and sell Licensed Products in the Territory. "Commercially Reasonable Best Efforts" means the efforts that a prudent person desirous of achieving a result would use in similar circumstances to ensure that such result is achieved expeditiously; provided, however, that an obligation to use commercially reasonable best efforts under this Agreement does not require Licensee to take actions that would result in a material adverse effect on Licensee or that would materially reduce the benefits to Licensee of the final result.
11. Foreign Licensed Patents. The parties shall jointly decide in which foreign countries, if any, Licensor will file foreign counterparts of the Licensed Patent(s) or related technologies, the expenses for which filings shall be borne solely by Licensor or as otherwise agreed in writing by the parties, and those countries will be included in the Territory upon the filing of such corresponding foreign patent having materially similar

claims as the U.S. Licensed Patent(s) in such country. In each foreign country in which such counterpart is filed are subject to any amounts due under this Section 11, upon the filing of such application, and for twenty-four (24) months thereafter, Licensee shall pay Licensor a Royalty of five percent (5%) of the Net Sales Price of all Licensed Products sold by Licensee in such foreign country. For avoidance of doubt, only one Royalty shall be payable on each Licensed Product sold by Licensee hereunder whether such Royalty amount is determined pursuant to Section 6 hereof or this Section 11. For the further avoidance of doubt, Royalties shall also be due in the event that Product is sold in any and all jurisdictions not covered by an applicable patent or pending application.

12. /reserved/.

13. Future Developments. All future developments, improvements and inventions relating to the Licensed Patent or Licensed Products, together with all intellectual property rights relating thereto, shall belong to the party developing or inventing the same. Any such subsequent developments, improvements or inventions made by Licensor shall be deemed to be included in the License granted herein. Joint developments, improvements and inventions shall be jointly owned by both parties. In the event of such joint ownership, the parties agree to cooperate in the seeking of patent or other intellectual property protection thereof. Additionally, the License granted herein shall extend to Licensee with regard to any such jointly developed intellectual property and/or patents for the term of this Agreement.

14. Infringement Actions. Subject to the following, both Licensor and Licensee shall have the right to initiate a patent infringement action against any third party reasonably believed to be infringing a Licensed Patent, but neither party shall have any obligation to do so. Licensee shall give Licensor the option by written notice of initiating any such action before doing so itself (or issuing any demand or threat of such action). If Licensee initiates such action or the parties cooperatively initiate a joint action: (i) Licensee and Licensor shall share equally all attendant costs and expenses incurred by Licensee and/or Licensor up to an aggregate amount of US \$2,000,000 ("Maximum Shared Costs") and, accordingly, Licensee shall indemnify, defend and hold harmless Licensor for any costs or expenses incurred by Licensor exceeding US \$1,000,000 (i.e., ½ of the Maximum Shared Costs); (ii) any judgment or settlement shall be collected for the benefit of Licensee and Licensor in proportion to the total costs and expenses incurred by each with respect to the action; (iii) Licensor's share of the Maximum Shared Costs shall be paid exclusively: (a) from Licensor's share of any applicable judgment or settlement and (b) to the extent not so paid and/or pending such judgment or settlement, in the form of a credit against any and all current and future Royalties due and payable by Licensee until paid in full; (iv) if Licensor's share of the Maximum Shared Costs exceeds the sum of (a) Licensor's share of all judgments or settlements and (b) all Royalties due and payable by Licensee pursuant to this Agreement, any such excess amount shall be forgiven; and (v) Licensee shall retain final control over any major strategic decisions and/or settlement of any such action. If any such action is initiated by only one party, the non-initiating party shall provide all cooperation reasonably requested by the party initiating the action.

15. Representations and Warranties of Licensor. The Licensor represents and warrants each of the following to Licensee, as of the date hereof:

- a. Ownership of Licensed Patent. Licensor owns all of the undivided right, title and interest in and to the Licensed Patent(s). As of the date hereof, there are no other domestic or foreign patents or patent applications owned by Licensor, or any Affiliate of Licensor, which are related to the technology and/or cover or pertain to Licensed Products.
- b. Validity of Licensed Patent. Except for prior art cited or submitted during the prosecution of the Licensed Patent(s) (and corresponding application(s)), Licensor is not aware of any factual circumstances which is likely to cause the Licensed Patent(s) to be or become invalid.
- c. No Conflict. The execution and performance of this Agreement by Licensor will not conflict with any other obligation of Licensor.
- d. Authority. The Person signing this Agreement on behalf of Licensor is duly authorized to do so in order to create a binding agreement upon Licensor.
- e. Maintenance. Licensor will maintain the Licensed Patent(s) in force during the term hereof, including making the timely payment of all maintenance fees and annuities necessary to do so.
- f. Disclaimer of Other Warranties. Except as provided in this Section 15, THE LICENSED PATENT IS LICENSED HEREUNDER ON AN AS IS BASIS. THERE ARE NO WARRANTIES OF ANY KIND, AND LICENSOR HEREBY DISCLAIMS ALL WARRANTIES, EXPRESS, IMPLIED, STATUTORY OR FROM A COURSE OF DEALING OR USAGE OF TRADE, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF NON-INFRINGEMENT AND THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY. LICENSOR DOES NOT WARRANT THAT THE LICENSED PATENT OR THE LICENSED PRODUCTS WILL FUNCTION UNINTERRUPTED OR ERROR FREE, NOR DOES IT MAKE ANY WARRANTY AS TO THE RESULTS THAT MAY BE OBTAINED FROM USE OF THE LICENSED PATENT OR LICENSED PRODUCTS.
- g. LIMITATION OF LIABILITY. LICENSOR SHALL NOT BE LIABLE IN CONTRACT OR IN TORT, INCLUDING NEGLIGENCE AND STRICT LIABILITY, FOR ANY SPECIAL, PUNITIVE, INDIRECT OR CONSEQUENTIAL LOSSES OR DAMAGES OF ANY KIND OR CHARACTER, INCLUDING LOSS OF USE, LOST PROFITS, LOSS OF REPUTATION, LOSS OF DATA OR THE COST OF ANY REPLACEMENT INTELLECTUAL PROPERTY, EVEN IF LICENSOR IS INFORMED IN ADVANCE OF THE POSSIBILITY OF DAMAGES. FURTHER, NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT TO

THE CONTRARY, LICENSOR'S AGGREGATE LIABILITY UNDER THIS AGREEMENT, WHETHER ARISING OUT OF CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED THE AVERAGE ANNUAL ROYALTY ACTUALLY PAID TO LICENSOR UNDER THIS AGREEMENT OVER THE LAST TWO (2) YEARS.

16. Representations and Warranties of Licensee. The Licensee represents and warrants each of the following to Licensor:

- a. No Conflict. The execution and performance of this Agreement by Licensee will not conflict with any other obligation of Licensee.
- b. Authority. The Person signing this Agreement on behalf of Licensee is duly authorized to do so in order to create a binding agreement upon Licensee.

17. Indemnification.

- a. By Licensee. If notified in writing by Licensor promptly upon Licensor's actual knowledge of same, Licensee shall indemnify, hold harmless, and defend Licensor and its Affiliates and their respective officers, directors, employees, agents, members, managers and contractors (the "Licensor Indemnified Parties") against any and all third-party claims, demands, liens, actions, suits, causes of action, obligations, controversies, debts, costs, attorneys' fees, expenses, damages, judgments, orders, and liabilities of whatever kind or nature at law arising out of, occurring or asserted against one or more of the Licensor Indemnified Parties arising out of (i) any Licensed Patent Challenge initiated by Licensee or any Affiliate of Licensee, or (ii) any Licensed Product manufactured, sold or distributed by Licensee including, the design, manufacture, distribution, marketing, or sale thereof, including any alleged defects, imperfection, and/or inherent dangers, whether obvious or hidden, in the Licensed Products or the use thereof, any product liability issues or claims, the packaging or labeling of a Licensed Product, the failure of a Licensed Product to conform to its published specifications or promotional or other informational materials, or a failure to warn.
- b. By Licensor. If notified in writing by Licensee promptly upon Licensee's constructive or actual knowledge of same, Licensor shall indemnify, hold harmless, and defend Licensee and its Affiliates and their respective officers, directors, employees, agents, members, managers and contractors (the "Licensee Indemnified Parties") against any and all third-party claims, demands, liens, actions, suits, causes of action, obligations, controversies, debts, costs, attorneys' fees, expenses, damages, judgments, orders, and liabilities of whatever kind or nature at law arising out of, occurring or asserted against one or more of the Licensee Indemnified Parties arising out of the actual or alleged infringement of the Licensed Product on the patent or other intellectual property rights of a third party; provided, however, Licensor's obligation under this subsection 17.b. shall not apply to any claims, demands, liens, actions, suits, causes of action, obligations, controversies, debts,

costs, attorneys' fees, expenses, damages, judgments, orders or liabilities relating to or arising from an infringement action initiated pursuant to Section 14 above.

18. Insurance. Licensee shall obtain and maintain current throughout the term of this Agreement, at its own expense, product liability and general liability insurance for claims or suits referred to in part (ii) of Section 17 in amounts no less than two million dollars (\$2,000,000) per occurrence, naming Licensor as an additional insured party and requiring that the insurer shall not terminate or materially modify such policy without written notice to Licensor at least twenty (20) days in advance thereof. Licensee shall provide Licensor with a certificate of insurance demonstrating the above required coverage. Licensee hereby waives for itself and its insurer(s) any and all rights of subrogation or transfer of claims against Licensor, and Licensee shall ensure that all such policies provide for such waiver of subrogation or transfer.
19. Marking. Licensee shall place in a conspicuous location on each Licensed Product, a patent notice in accordance with 35 U.S.C. §287 ("Licensed Patent Notice") that either physically or virtually identifies the number(s) of the Licensed Patent(s) applicable to each Licensed Product. Licensee shall also: (a) reasonably amend such Licensed Patent Notice (including, but not limited to, the addition and deletion of one or more patents), from time to time, at Licensor's written direction; and, (b) notify Licensee of any request for disclosure under 35 U.S.C. §287(b)(4)(B) related to the Licensed Patent.
20. No Trademark License. Licensor is not licensing any of its names or trademarks to Licensee as part of this Agreement. Licensee shall sell all Licensed Products under its own names and trademarks.
21. Confidentiality.
 - a. Each party (the "Receiving Party") shall: (a) treat as confidential, and preserve the confidentiality of, all Confidential Information disclosed by the other party (the "Disclosing Party"); (b) use such Confidential Information solely for the purposes of this Agreement; (c) limit dissemination of such Confidential Information to those individuals to whom disclosure is necessary for the purposes of this Agreement; and, (d) immediately notify the Disclosing Party upon discovery of any loss or unauthorized disclosure of the Disclosing Party's Confidential Information and use all reasonable efforts to retrieve such Confidential Information.
 - h. The confidentiality obligations imposed by this Agreement shall not apply to any information that: (a) is or becomes publicly available through no fault of the Receiving Party; (b) is obtained by the Receiving Party from a third person without breach by such third person of an obligation of confidence; (c) is already known by the Receiving Party at the time of disclosure; or (d) is required to be disclosed by the Receiving Party pursuant to a valid judicial or administrative order if the Receiving Party: (i) provides timely written notice of such order to the Disclosing Party and reasonably cooperates with any efforts by the Disclosing Party to contest or limit the scope of such order; and (ii) uses all reasonable efforts to limit the

disclosure of such Confidential Information and seek a protective order or an equivalent to protect the disclosure of such Confidential Information.

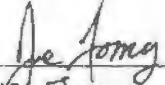
22. Choice of Law: Prevailing Party. This Agreement is governed by the laws of the State of Delaware without regard to the principles of conflict of laws. Each party hereby irrevocably and unconditionally submits to the exclusive jurisdiction and venue of Delaware state and federal courts. In the event of any litigation or arbitration between the parties related to this Agreement, the prevailing party shall be entitled to recover from the other party reasonable attorneys' fees and costs.
23. Arbitration. Any claim or controversy arising out of, or relating to, this Agreement, or the breach thereof, shall be settled by arbitration by a single arbitrator in accordance with the Commercial Arbitration Rules of the American Arbitration Association, and the judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. The site of the arbitration shall be Boise, Idaho if Lessor is the defendant and Wilmington, Delaware if the Lessee is the defendant.
24. Independent Contractors. Each of the parties hereto is acting as an independent contractor hereunder. Neither party will act as an agent of the other party or have any right or authority to assume any obligation for, or bind, the other party. This Agreement does not and shall not be deemed to create a partnership, joint venture or any other legal relationship between the parties.
25. Notices. Notices that are required to be sent hereunder shall be in writing and sent via e-mail with confirmation by overnight courier as follows or to such other address as may subsequently be specified by the receiving party:
- a. If to the Licensor:
Cold Chain LLC,
875 W. McGregor Ct., Ste 150
Boise, Idaho 83705
Attn: CEO
E-mail: jforney@coldchainllc.com
 - b. If to the Licensee:
Ridge Corporation
8290 Dustin Road
Galena, Ohio 43021
Attn: Gary A. Grandominico
E-mail: gary.grandominico@ridgecorp.com
26. No Waiver. The failure or delay by either party to enforce any of the provisions hereof shall not be construed as a waiver and shall not preclude either party from thereafter enforcing such provision or any other provision hereof.

27. Assignment. Licensee shall not assign this Agreement or any of its rights or obligations under this Agreement without the prior written consent of Licensor, such consent not to be unreasonably withheld, conditioned or delayed; provided, however, that no such consent will be required to assign this Agreement to a purchaser of substantially all of Licensee's assets or a controlling interest in Licensee's capital stock. Licensee shall notify Licensor in writing of any such permitted assignment within thirty (30) days of such assignment. This Agreement and all of Licensee's rights hereunder shall automatically terminate upon the occurrence of any assignment in violation of the foregoing. Licensor may assign, transfer or delegate this Agreement or any right, license or obligation hereunder in its sole discretion as a part of any transfer of ownership or control without notice to or consent from Licensee. This Agreement shall be binding and inure to the benefit of any permitted assignees, transferees and other successors of either party.
28. Severability. Whenever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law. If any provision hereof is held to be invalid, illegal or unenforceable, no other provision hereof shall be affected and this Agreement shall be reformed, construed and enforced in such manner as will effect as nearly as lawfully possible the purposes and intent of the invalid, illegal or unenforceable provision.
29. Headings. The titles and headings to sections herein are inserted for convenience and reference only, and are not intended to be part of, or affect the meaning or interpretation of, any portion of this Agreement.
30. Counterparts and Electronic Signatures. This Agreement may be executed in counterparts, each of which will be deemed to be an original, but all of which together will constitute one and the same document. This Agreement may be signed by facsimile or by scanned e-mail and when so executed shall be deemed to be an original counterpart hereof.
31. Entire Agreement. This Agreement constitutes the entire agreement of the parties with respect to the subject matter hereof and it supersedes all prior agreements, understandings and commitments, written or oral, with respect thereto. Any amendment or modification hereof must be in writing and signed by both of the parties hereto.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

COLD CHAIN, LLC, a Delaware limited liability company

By: 
Name: Joseph Forney
Its: CEO

RIDGE CORPORATION, an Ohio corporation


By: 
Name: GARY GRANDMICKO
Its: CO Founder + CEO

EXHIBIT 3

AMENDED AND RESTATED LICENSE AGREEMENT

This Amended and Restated License Agreement (this “Agreement”) is made and entered into as of the 1st day of May, 2023 (the “Effective Date”), by and between COLD CHAIN, LLC, a Delaware limited liability company (the “Licensor”) and RIDGE CORPORATION, an Ohio corporation (the “Licensee”). The Agreement amends and restates in its entirety that certain License Agreement between Licensor and Licensee dated effective February 15, 2023.

The parties hereby agree as follows:

- I. Defined Terms. As used in this Agreement, the following defined terms shall have the following respective meanings:
 - a. Affiliate. “Affiliate” shall mean with respect to a party, any Person that, directly or indirectly, is controlled by, controls, or is under common control with such party, only while such control exists.
 - b. Confidential Information. “Confidential Information” shall mean: any and all technical or business data, information or items (including third party data, information, or items) in whatever form or medium, of one party provided to or obtained by the other party or accessed by the other party pursuant to this Agreement regardless of whether such data, information or items are marked or identified as “Confidential”.
 - c. Door Manufacturer. “Door Manufacturer” shall have the meaning set forth in Section 3 of this Agreement.
 - d. Licensed Patent. “Licensed Patent(s)” shall mean those certain patents legally described as U.S. 10,066,434 (application S/N 14,875,577) titled INSULATED OVERHEAD DOOR, filed on October 5, 2015 claiming priority to U.S. 9,151,084, and U.S. 9,151,084 (application S/N 13/585,944) titled INSULATED OVERHEAD DOOR, filed on August 15, 2012 claiming the benefit of U.S. Provisional Application 61/523,786 filed on August 15, 2011 including all future, pending, expired counterparts (domestic and foreign) related to the foregoing patents and/or technological scope.
 - e. Licensed Patent Challenge. “Licensed Patent Challenge” shall mean Licensee or its Affiliates, directly (e.g., by itself) or indirectly (e.g., through a “straw man,” or other involvement for or with a third party, or otherwise), challenging the scope, validity, enforceability, ownership, or inventorship of the Licensed Patent, whether pursuant to a court action, reexamination, opposition or patent office proceeding. However, “Licensed Patent Challenge” shall not include compliance with subpoenas or other court orders, provided that (and to the extent): (i) Licensee and its Affiliates have not directly or indirectly encouraged or acquiesced to the issuance of such order or subpoena; and (ii) Licensee and its Affiliates have given Licensor prompt notice of such order or subpoena, and reasonably cooperate with

Licensors to challenge and/or limit the scope of such subpoena or court order with respect to any response thereto.

- f. Licensed Product. “Licensed Product” or “Licensed Products” shall mean a truck roll-up door, trailer roll-up door or other roll-up door application that includes every limitation of at least one valid and enforceable claim of the Licensed Patent(s) and manufactured, used, imported, offered for sale or sold by the Licensee or a Door Manufacturer.
 - g. Net Sales Price. “Net Sales Price” shall mean the amount actually received by the Licensee for each Panel or Licensed Product, including adjustments for all discounts and deductions allowed by Licensee to purchaser, less all freight costs, sales, excise, value added or similar taxes and less any returns and allowances in respect of such Panels and/or Licensed Products all as actually incurred or paid by Licensee. In the event that a Panel or Licensed Product is sold by Licensee to any Affiliate of Licensee or sold in combination with another product, then the Net Sales Price with respect to such sales will be the greater of either (i) the above definition of Net Sales Price (as applied to sales of such product to the Affiliate, if applicable), or (ii) the average Net Sales Price of all Panels or Licensed Products sold by Licensee to all non-Affiliates during the calendar quarter in which such sale was made.
 - h. Panel. “Panel” shall mean any roll-up door panel sold by Licensee to a Door Manufacturer for purposes of manufacturing Licensed Products pursuant to a sublicense of the License from Licensee to such Door Manufacturer, as further set forth in this Agreement.
 - i. Person. “Person” shall mean any individual, corporation, limited liability company, partnership, joint venture, trust, business, association or other entity.
 - j. Territory. “Territory” shall mean all countries of the world.
2. Term and Termination. The initial term of this Agreement shall begin on the Effective Date and shall continue until the expiration of the last expiring Licensed Patent(s) on October 19, 2032. Notwithstanding the stated term hereof, either party may terminate this Agreement in the event of a material breach hereof by the other party provided that (i) the terminating party notifies the other party in writing of the specific nature of such material breach, and (ii) the other party fails to correct the same within twenty-one (21) days after receipt of such notice (or such additional time as reasonably necessary to cure the breach so long as the other party diligently pursues the cure to completion).
3. Grant of License. Licensors hereby grants to Licensee an exclusive, royalty bearing, non-transferable, sublicensable right and license to make, have made, use, sell, install, service, import/export and/or otherwise commercialize Licensed Products in the Territory (the “License”). Notwithstanding the foregoing, Licensee’s right of sublicense shall: (a) be limited to sublicensing to those sublicensees that agree to purchase and use Panels in the manufacture and sale of other Licensed Products (each a, “Door Manufacturer”); (b) be

granted in each instance for a period no longer than the term of this Agreement (including any permitted disposal under Section 5 of this Agreement); and (c) not be further sublicensable by Door Manufacturers. Except for the licenses granted to Licensee in this Section (including, without limit, attendant rights of sublicense to Door Manufacturers), Licensors hereby expressly retains all rights, title and interest in and to all Licensed Patents and Licensors' other intellectual property; and, no other rights are or shall be deemed to be granted to Licensee by implication, estoppel, statute, operation of law or otherwise pursuant to this Agreement.

4. Survival. The following Sections shall survive the expiration or termination of this Agreement: 6 (with respect to any amounts owed prior to termination or expiration), 7 (with respect to any amounts owed prior to termination or expiration), 8 (pursuant to its terms), 13, 14 (with respect to any action commenced prior to expiration or termination), 17, 21, 22, 23, 25, 26, 28, 29 and 31.
5. Disposal Upon Expiration. Upon expiration or termination of this Agreement, Licensee shall have the right, pursuant to the provisions hereof, for a period of one hundred and eighty (180) days, to dispose of all unsold Licensed Products manufactured by Licensee or by Door Manufacturers or in the process of manufacture at the time of expiration or termination; provided that Licensee makes timely payment to Licensors of all Royalties due on such Licensed Products.
6. Royalties. During the term hereof, Licensee shall pay royalties ("Royalty" or "Royalties") to Licensors as follows:
 - a. Royalty Percentage. Subject to Section 11, Licensee shall pay to Licensors a Royalty in the amount of five percent (5%) of the Net Sales Price of (i) all Panels and (ii) all Licensed Products, if any, which are sold by Licensee itself in the Territory; provided, however, that no such Royalties shall apply to and/or accrue before and until May 1, 2025 as additional consideration for Licensee's best efforts to commercialize the Licensed Patent.
 - b. Licensed Patent Challenge. Notwithstanding the above, to the extent the following is enforceable under applicable law, if Licensee or any of its Affiliates or agents directly or indirectly bring or initiate a Licensed Patent Challenge during the term of this Agreement, Licensee shall pay Royalties (as per Section 6.a, above) to Licensors (while such Licensed Patent Challenge continues) at the rate of fifteen percent (15%).
 - c. Currency. Licensee shall make all payments of Royalties in U.S. dollars by wire transfer to the account Licensors designates in writing to Licensee from time to time, without deduction for bank wire or other charges (which charges will be paid by Licensee). For any sales that are conducted in a foreign currency, Licensee shall provide currency conversion information showing the foreign currency and the conversion to U.S. Dollars using the exchange rate for the fifteenth (15th) day of the relevant month in which the sale occurred (or the next business day if such day

falls on a weekend or a holiday) as set forth in the U.S. edition of *The Wall Street Journal*.

- d. Late Payment. If any payment of Royalties is delayed more than fifteen (15) days after the due date (as set forth in Section 7, below), and if such deficiency is not cured within fourteen (14) business days after receipt by Licensee of written notice thereof from Licensor, then Licensee shall pay interest on the unpaid Royalty amount from and after the date on which the same became due at a rate of one and a half percent (1.5%), compounded monthly, or the maximum amount allowed by law, whichever is less. In the event that any collection action is initiated, the prevailing party shall be entitled to recover its attorneys' fees and other costs of bringing or defending such action.
 - e. Patent Exhaustion. Each Licensed Product on which Licensee has paid a Royalty hereunder may be subsequently installed, serviced, used, licensed and re-sold by each subsequent owner thereof without any further Royalty obligation to Licensor with respect to the Licensed Patent(s).
 - f. Taxes. Each party shall be solely responsible for its own taxes, charges, expenses and duties incurred in connection with the sale of Panels and/or Licensed Products and any payment of Royalties.
7. Royalty Payments and Reports. On or before the last day of the month following the end of each calendar quarter, Licensee shall pay to Licensor the Royalties for such quarter. Each Royalty payment shall be accompanied by a statement of the number of Panels and/or Licensed Products sold by Licensee during such quarter, in units and dollars, and Licensee's calculation of the Royalty due thereupon, including any currency conversion information.
8. Audit Rights. At all times during this Agreement and for two (2) years following its termination or expiration, Licensee shall make all relevant documents, reports and books of account which contain information reasonably related to the amount of Royalties due hereunder available to Licensor and Licensor's public accounting firm for inspection, audit and copying during normal business hours, upon not less than five (5) business days advance notice, which will be made by Licensor at its own expense, except as provided below. Licensee shall also make reasonably available qualified employees and agents to answer all questions pertaining to such audit. If the audit reveals that there is an underpayment error in excess of the greater of US \$5,000 or twenty percent (20%) of the Royalties which would have been properly payable in any calendar quarter, then without prejudice to any other amounts due to Licensor or to any of its rights hereunder, all third party reasonable costs and expenses paid by Licensor in connection with such audit shall be borne and promptly paid by Licensee. Licensee shall have the right to require that Licensor's public accounting firm sign a reasonable Confidentiality Agreement prior to any audit limiting its disclosure of Licensee's financial information only to Licensor and only to such information as reasonably relates to compliance with this Agreement.

9. Exclusivity. The License granted to Licensee hereunder shall be exclusive through the term of this Agreement.
10. Commercialization. Licensee acknowledges and agrees that part of the consideration for Licensors grant of the License herein is Licensee's best efforts to sell Panels. Accordingly, Licensors shall have the right to terminate this Agreement, upon ten (10) days written notice, if Licensee fails to use Commercially Reasonable Best Efforts (as defined below) to sell Panels in the Territory. "Commercially Reasonable Best Efforts" means the efforts that a prudent person desirous of achieving a result would use in similar circumstances to ensure that such result is achieved expeditiously; provided, however, that an obligation to use commercially reasonable best efforts under this Agreement does not require Licensee to take actions that would result in a material adverse effect on Licensee or that would materially reduce the benefits to Licensee of the final result.
11. Foreign Licensed Patents. The parties shall jointly decide in which foreign countries, if any, Licensors will file foreign counterparts of the Licensed Patent(s) or related technologies, the expenses for which filings shall be borne solely by Licensors or as otherwise agreed in writing by the parties, and those countries will be included in the Territory upon the filing of such corresponding foreign patent having materially similar claims as the U.S. Licensed Patent(s) in such country. In each foreign country in which such counterpart is filed are subject to any amounts due under this Section 11, upon the filing of such application, and for twenty-four (24) months thereafter, Licensee shall pay Licensors a Royalty of five percent (5%) of the Net Sales Price of all Panels or Licensed Products sold by Licensee in such foreign country. For avoidance of doubt, only one Royalty shall be payable on each Panel or Licensed Product sold by Licensee hereunder whether such Royalty amount is determined pursuant to Section 6 hereof or this Section 11. For the further avoidance of doubt, Royalties shall also be due in the event that a Panel or Licensed Product is sold by Licensee in any and all jurisdictions not covered by an applicable patent or pending application.
12. [reserved].
13. Future Developments. All future developments, improvements and inventions relating to the Licensed Patent or Licensed Products, together with all intellectual property rights relating thereto, shall belong to the party developing or inventing the same. Any such subsequent developments, improvements or inventions made by Licensors shall be deemed to be included in the License granted herein. Joint developments, improvements and inventions shall be jointly owned by both parties. In the event of such joint ownership, the parties agree to cooperate in the seeking of patent or other intellectual property protection thereof. Additionally, the License granted herein shall extend to Licensee with regard to any such jointly developed intellectual property and/or patents for the term of this Agreement.
14. Infringement Actions. Subject to the following, both Licensors and Licensee shall have the right to initiate a patent infringement action against any third party reasonably believed to be infringing a Licensed Patent, but neither party shall have any obligation to do so. Licensee shall give Licensors the option by written notice of initiating any such action

before doing so itself (or issuing any demand or threat of such action). If Licensee initiates such action or the parties cooperatively initiate a joint action: (i) Licensee and Licensor shall share equally all attendant costs and expenses incurred by Licensee and/or Licensor up to an aggregate amount of US \$2,000,000 ("Maximum Shared Costs") and, accordingly, Licensee shall indemnify, defend and hold harmless Licensor for any costs or expenses incurred by Licensor exceeding US \$1,000,000 (i.e., ½ of the Maximum Shared Costs); (ii) any judgment or settlement shall be collected for the benefit of Licensee and Licensor in proportion to the total costs and expenses incurred by each with respect to the action; (iii) Licensor's share of the Maximum Shared Costs shall be paid exclusively: (a) from Licensor's share of any applicable judgment or settlement and (b) to the extent not so paid and/or pending such judgment or settlement, in the form of a credit against any and all current and future Royalties due and payable by Licensee until paid in full; (iv) if Licensor's share of the Maximum Shared Costs exceeds the sum of (a) Licensor's share of all judgments or settlements and (b) all Royalties due and payable by Licensee pursuant to this Agreement, any such excess amount shall be forgiven; and (v) Licensee shall retain final control over any major strategic decisions and/or settlement of any such action. If any such action is initiated by only one party, the non-initiating party shall provide all cooperation reasonably requested by the party initiating the action.

15. Representations and Warranties of Licensor. The Licensor represents and warrants each of the following to Licensee, as of the date hereof:

- a. Ownership of Licensed Patent. Licensor owns all of the undivided right, title and interest in and to the Licensed Patent(s). As of the date hereof, there are no other domestic or foreign patents or patent applications owned by Licensor, or any Affiliate of Licensor, which are related to the technology and/or cover or pertain to Licensed Products.
- b. Validity of Licensed Patent. Except for prior art cited or submitted during the prosecution of the Licensed Patent(s) (and corresponding application(s)), Licensor is not aware of any factual circumstances which is likely to cause the Licensed Patent(s) to be or become invalid.
- c. No Conflict. The execution and performance of this Agreement by Licensor will not conflict with any other obligation of Licensor.
- d. Authority. The Person signing this Agreement on behalf of Licensor is duly authorized to do so in order to create a binding agreement upon Licensor.
- e. Maintenance. Licensor will maintain the Licensed Patent(s) in force during the term hereof, including making the timely payment of all maintenance fees and annuities necessary to do so.
- f. Disclaimer of Other Warranties. Except as provided in this Section 15, THE LICENSED PATENT IS LICENSED HEREUNDER ON AN AS IS BASIS. THERE ARE NO WARRANTIES OF ANY KIND, AND LICENSOR HEREBY DISCLAIMS ALL WARRANTIES, EXPRESS, IMPLIED, STATUTORY OR

FROM A COURSE OF DEALING OR USAGE OF TRADE, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF NON-INFRINGEMENT AND THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY. LICENSOR DOES NOT WARRANT THAT THE LICENSED PATENT OR THE LICENSED PRODUCTS WILL FUNCTION UNINTERRUPTED OR ERROR FREE, NOR DOES IT MAKE ANY WARRANTY AS TO THE RESULTS THAT MAY BE OBTAINED FROM USE OF THE LICENSED PATENT OR LICENSED PRODUCTS.

- g. LIMITATION OF LIABILITY. LICENSOR SHALL NOT BE LIABLE IN CONTRACT OR IN TORT, INCLUDING NEGLIGENCE AND STRICT LIABILITY, FOR ANY SPECIAL, PUNITIVE, INDIRECT OR CONSEQUENTIAL LOSSES OR DAMAGES OF ANY KIND OR CHARACTER, INCLUDING LOSS OF USE, LOST PROFITS, LOSS OF REPUTATION, LOSS OF DATA OR THE COST OF ANY REPLACEMENT INTELLECTUAL PROPERTY, EVEN IF LICENSOR IS INFORMED IN ADVANCE OF THE POSSIBILITY OF DAMAGES. FURTHER, NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT TO THE CONTRARY, LICENSOR'S AGGREGATE LIABILITY UNDER THIS AGREEMENT, WHETHER ARISING OUT OF CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED THE AVERAGE ANNUAL ROYALTY ACTUALLY PAID TO LICENSOR UNDER THIS AGREEMENT OVER THE LAST TWO (2) YEARS.

16. Representations and Warranties of Licensee. The Licensee represents and warrants each of the following to Licensor:

- a. No Conflict. The execution and performance of this Agreement by Licensee will not conflict with any other obligation of Licensee.
- b. Authority. The Person signing this Agreement on behalf of Licensee is duly authorized to do so in order to create a binding agreement upon Licensee.

17. Indemnification.

- a. By Licensee. If notified in writing by Licensor promptly upon Licensor's actual knowledge of same, Licensee shall indemnify, hold harmless, and defend Licensor and its Affiliates and their respective officers, directors, employees, agents, members, managers and contractors (the "Licensor Indemnified Parties") against any and all third-party claims, demands, liens, actions, suits, causes of action, obligations, controversies, debts, costs, attorneys' fees, expenses, damages, judgments, orders, and liabilities of whatever kind or nature at law arising out of, occurring or asserted against one or more of the Licensor Indemnified Parties arising out of (i) any Licensed Patent Challenge initiated by Licensee or any Affiliate of Licensee, or (ii) any Licensed Product manufactured, sold or distributed by Licensee including, the design, manufacture, distribution, marketing, or sale

thereof, including any alleged defects, imperfection, and/or inherent dangers, whether obvious or hidden, in the Licensed Products or the use thereof, any product liability issues or claims, the packaging or labeling of a Licensed Product, the failure of a Licensed Product to conform to its published specifications or promotional or other informational materials, or a failure to warn.

- b. By Licensor. If notified in writing by Licensee promptly upon Licensee's constructive or actual knowledge of same, Licensor shall indemnify, hold harmless, and defend Licensee, its Affiliates and their respective officers, directors, employees, agents, members, managers and contractors (the "Licensee Indemnified Parties") against any and all third-party claims, demands, liens, actions, suits, causes of action, obligations, controversies, debts, costs, attorneys' fees, expenses, damages, judgments, orders, and liabilities of whatever kind or nature at law arising out of, occurring or asserted against one or more of the Licensee Indemnified Parties arising out of the actual or alleged infringement of the Licensed Product on the patent or other intellectual property rights of a third party; provided, however, Licensor's obligation under this subsection 17.b. shall not apply to any claims, demands, liens, actions, suits, causes of action, obligations, controversies, debts, costs, attorneys' fees, expenses, damages, judgments, orders or liabilities relating to or arising from an infringement action initiated pursuant to Section 14 above.

18. Insurance. Licensee shall obtain and maintain current throughout the term of this Agreement, at its own expense, product liability and general liability insurance for claims or suits referred to in part (ii) of Section 17 in amounts no less than two million dollars (\$2,000,000) per occurrence, naming Licensor as an additional insured party and requiring that the insurer shall not terminate or materially modify such policy without written notice to Licensor at least twenty (20) days in advance thereof. Licensee shall provide Licensor with a certificate of insurance demonstrating the above required coverage. Licensee hereby waives for itself and its insurer(s) any and all rights of subrogation or transfer of claims against Licensor, and Licensee shall ensure that all such policies provide for such waiver of subrogation or transfer.

19. Marking. Licensee shall place or require each Door Manufacturer to place in a conspicuous location on each Licensed Product, a patent notice in accordance with 35 U.S.C. §287 ("Licensed Patent Notice") that either physically or virtually identifies the number(s) of the Licensed Patent(s) applicable to each Licensed Product. Licensee shall also: (a) reasonably amend such Licensed Patent Notice (including, but not limited to, the addition and deletion of one or more patents), from time to time, at Licensor's written direction; and, (b) notify Licensor of any request for disclosure Licensee receives under 35 U.S.C. §287(b)(4)(B) related to the Licensed Patent.

20. No Trademark License. Licensor is not licensing any of its names or trademarks to Licensee or any Door Manufacturer as part of this Agreement. Unless otherwise agreed to by the parties in writing, Licensee shall not sell Licensed Products under any of Licensor's names and trademarks and shall require Door Manufacturers not to sell Licensed Products under any of Licensor's names and trademarks.

21. Confidentiality.

- a. Each party (the “Receiving Party”) shall: (a) treat as confidential, and preserve the confidentiality of, all Confidential Information disclosed by the other party (the “Disclosing Party”); (b) use such Confidential Information solely for the purposes of this Agreement; (c) limit dissemination of such Confidential Information to those individuals to whom disclosure is necessary for the purposes of this Agreement; and, (d) immediately notify the Disclosing Party upon discovery of any loss or unauthorized disclosure of the Disclosing Party’s Confidential Information and use all reasonable efforts to retrieve such Confidential Information.
- b. The confidentiality obligations imposed by this Agreement shall not apply to any information that: (a) is or becomes publicly available through no fault of the Receiving Party; (b) is obtained by the Receiving Party from a third person without breach by such third person of an obligation of confidence; (c) is already known by the Receiving Party at the time of disclosure; or (d) is required to be disclosed by the Receiving Party pursuant to a valid judicial or administrative order if the Receiving Party: (i) provides timely written notice of such order to the Disclosing Party and reasonably cooperates with any efforts by the Disclosing Party to contest or limit the scope of such order; and (ii) uses all reasonable efforts to limit the disclosure of such Confidential Information and seek a protective order or an equivalent to protect the disclosure of such Confidential Information.

22. Choice of Law; Prevailing Party. This Agreement is governed by the laws of the State of Delaware without regard to the principles of conflict of laws. Each party hereby irrevocably and unconditionally submits to the exclusive jurisdiction and venue of Delaware state and federal courts. In the event of any litigation or arbitration between the parties related to this Agreement, the prevailing party shall be entitled to recover from the other party reasonable attorneys’ fees and costs.

23. Arbitration. Any claim or controversy arising out of, or relating to, this Agreement, or the breach thereof, shall be settled by arbitration by a single arbitrator in accordance with the Commercial Arbitration Rules of the American Arbitration Association, and the judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. The site of the arbitration shall be Boise, Idaho if Lessor is the defendant and Columbus, Ohio if the Lessee is the defendant.

24. Independent Contractors. Each of the parties hereto is acting as an independent contractor hereunder. Neither party will act as an agent of the other party or have any right or authority to assume any obligation for, or bind, the other party. This Agreement does not and shall not be deemed to create a partnership, joint venture or any other legal relationship between the parties.

25. Notices. Notices that are required to be sent hereunder shall be in writing and sent via e-mail with confirmation by overnight courier as follows or to such other address as may subsequently be specified by the receiving party:

a. If to the Licensors:

Cold Chain LLC.
875 W. McGregor Ct., Ste 150
Boise, Idaho 83705
Attn: CEO
E-mail: jforney@coldchainllc.com

b. If to the Licensee:

Ridge Corporation
8290 Dustin Road
Galena, Ohio 43021
Attn: Gary A. Grandominico
E-mail: gary.grandominico@ridgecorp.com

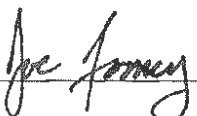
26. No Waiver. The failure or delay by either party to enforce any of the provisions hereof shall not be construed as a waiver and shall not preclude either party from thereafter enforcing such provision or any other provision hereof.
27. Assignment. Licensee shall not assign this Agreement or any of its rights or obligations under this Agreement without the prior written consent of Licensors, such consent not to be unreasonably withheld, conditioned or delayed; provided, however, that no such consent will be required to assign this Agreement to a purchaser of substantially all of Licensee's assets or a controlling interest in Licensee's capital stock. Licensee shall notify Licensors in writing of any such permitted assignment within thirty (30) days of such assignment. This Agreement and all of Licensee's rights hereunder shall automatically terminate upon the occurrence of any assignment in violation of the foregoing. Licensors may assign, transfer or delegate this Agreement or any right, license or obligation hereunder in its sole discretion as a part of any transfer of ownership or control without notice to or consent from Licensee. This Agreement shall be binding and inure to the benefit of any permitted assignees, transferees and other successors of either party.
28. Severability. Whenever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law. If any provision hereof is held to be invalid, illegal or unenforceable, no other provision hereof shall be affected and this Agreement shall be reformed, construed and enforced in such manner as will effect as nearly as lawfully possible the purposes and intent of the invalid, illegal or unenforceable provision.
29. Headings. The titles and headings to sections herein are inserted for convenience and reference only, and are not intended to be part of, or affect the meaning or interpretation of, any portion of this Agreement.
30. Counterparts and Electronic Signatures. This Agreement may be executed in counterparts, each of which will be deemed to be an original, but all of which together will constitute one and the same document. This Agreement may be signed by facsimile or by scanned e-mail and when so executed shall be deemed to be an original counterpart hereof.

31. Entire Agreement. This Agreement constitutes the entire agreement of the parties with respect to the subject matter hereof and it supersedes all prior agreements, understandings and commitments, written or oral, with respect thereto. Any amendment or modification hereof must be in writing and signed by both of the parties hereto.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated License Agreement as of the date first above written.

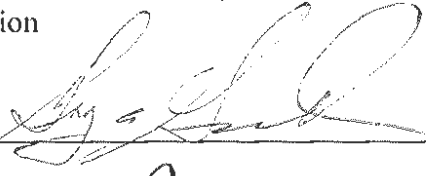
COLD CHAIN, LLC, a Delaware limited liability company

By: 

Name: Joe Forney

Its: CEO

RIDGE CORPORATION, an Ohio corporation

By: 

Name: GARY GRANDOMINICO

Its: CEO

EXHIBIT 4



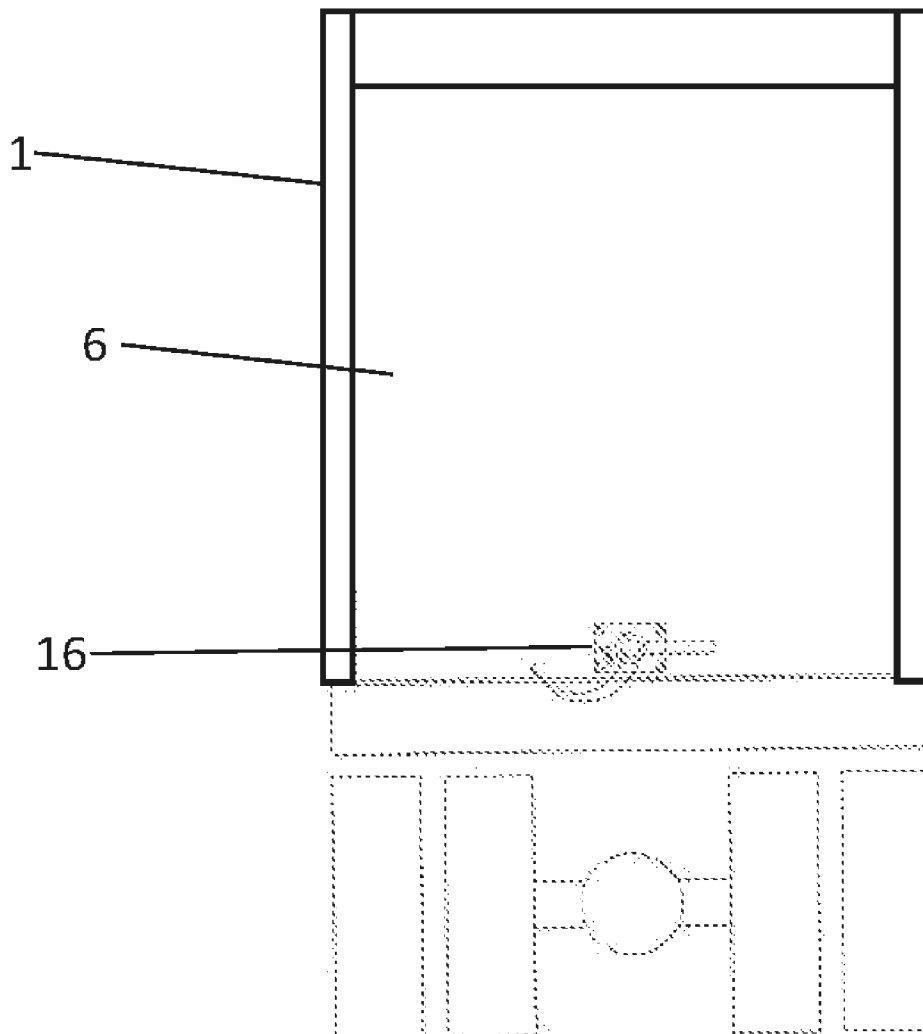
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(19) **United States**(12) **Patent Application Publication**
Phlipot et al.(10) **Pub. No.: US 2022/0169099 A1**(43) **Pub. Date: Jun. 2, 2022**(54) **SINGLE PANEL ROLL-UP DOOR***E06B 9/06* (2006.01)(71) Applicants: **Jeff Phlipot**, Sidney, OH (US); **Mark Schneider**, Sidney, OH (US); **Larry Phlipot**, Sidney, OH (US)*E06B 9/58* (2006.01)(52) **U.S. Cl.**
CPC *B60J 5/14* (2013.01); *E06B 9/58* (2013.01);
E06B 9/0638 (2013.01); *E06B 3/485* (2013.01)(72) Inventors: **Jeff Phlipot**, Sidney, OH (US); **Mark Schneider**, Sidney, OH (US); **Larry Phlipot**, Sidney, OH (US)(21) Appl. No.: **17/676,144**(57) **ABSTRACT**(22) Filed: **Feb. 19, 2022****Related U.S. Application Data**

(60) Provisional application No. 63/254,662, filed on Oct. 12, 2021.

Publication Classification(51) **Int. Cl.**
B60J 5/14 (2006.01)
E06B 3/48 (2006.01)

A single panel roll-up door comprising a panel, Roller brackets, rollers, a left roller series, a right roller series. Further the back side of the panel, wherein the surface of the back side of the panel comprising a first plateau, a first recessed channel, a plateau, a recessed channel, and a last recessed channel. Wherein the single panel roll-up door is coupled to a framed opening of a container, and the panel of the single panel roll-up door can be selectively in an opened position or closed position. When in the opened position the panel rest in the guide tracks in parallel.



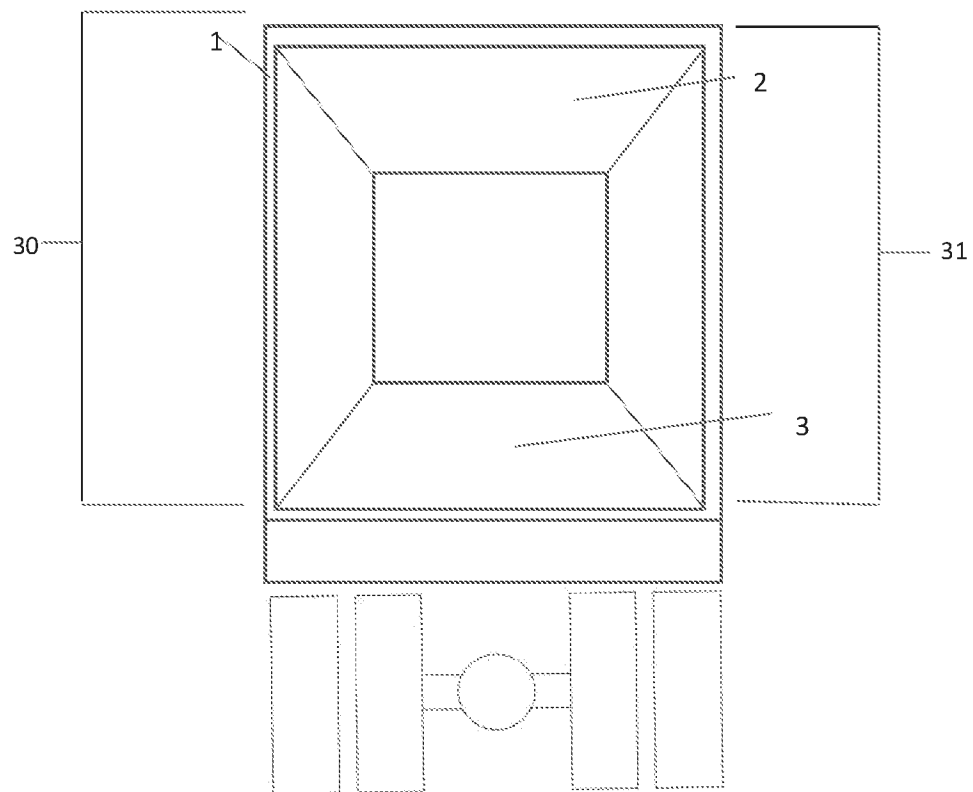


FIG. 1

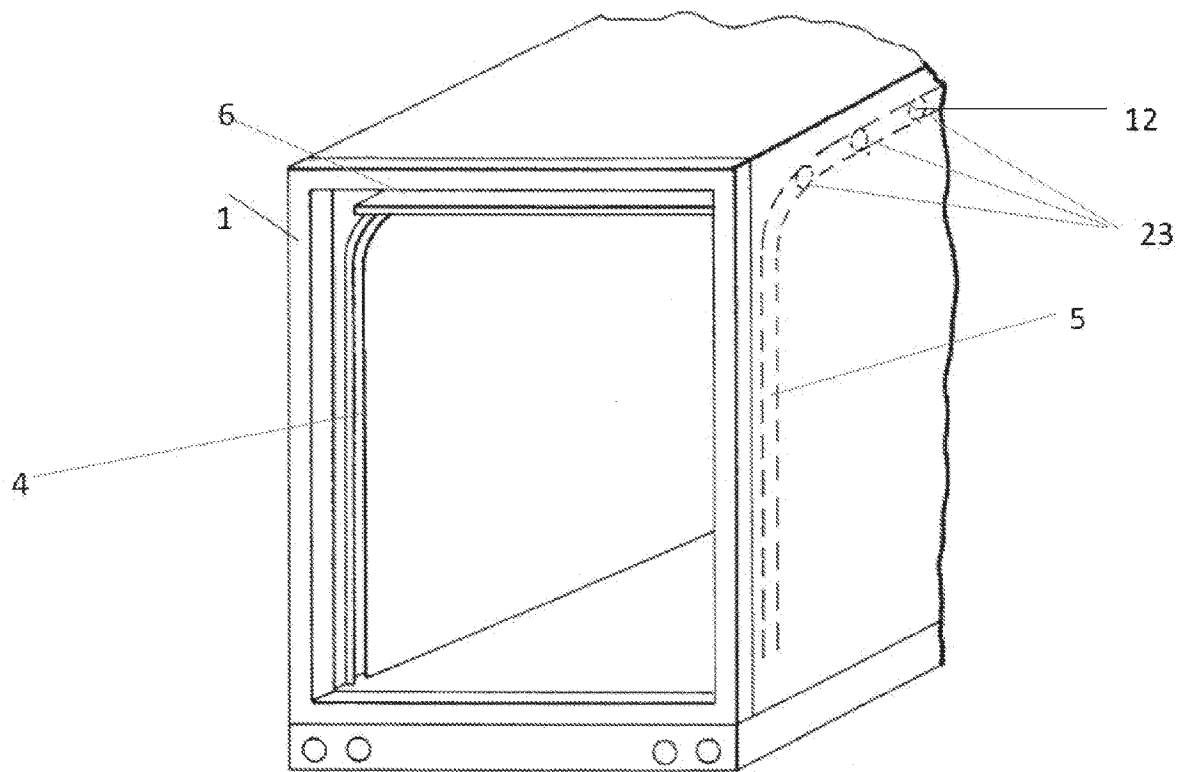


FIG. 2

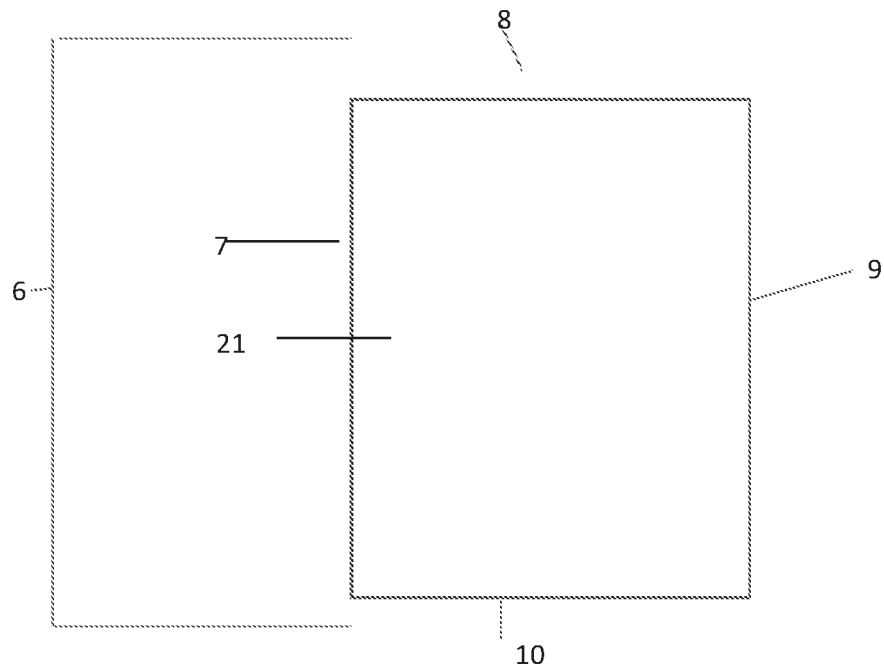


FIG. 3

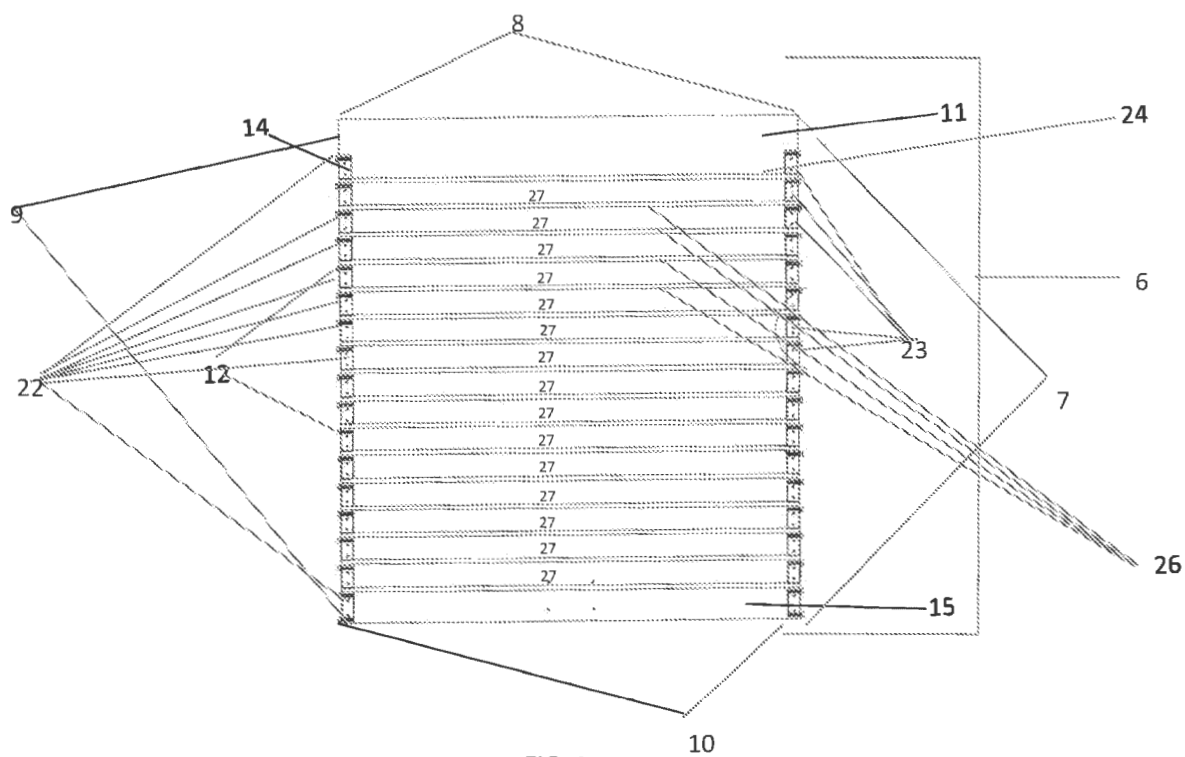


FIG. 4

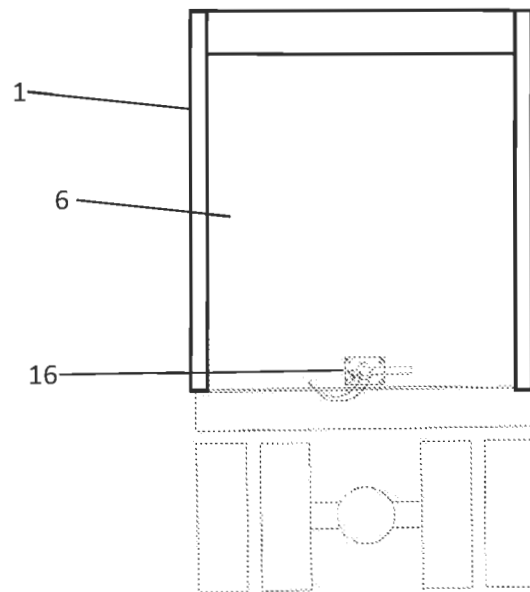


FIG. 5

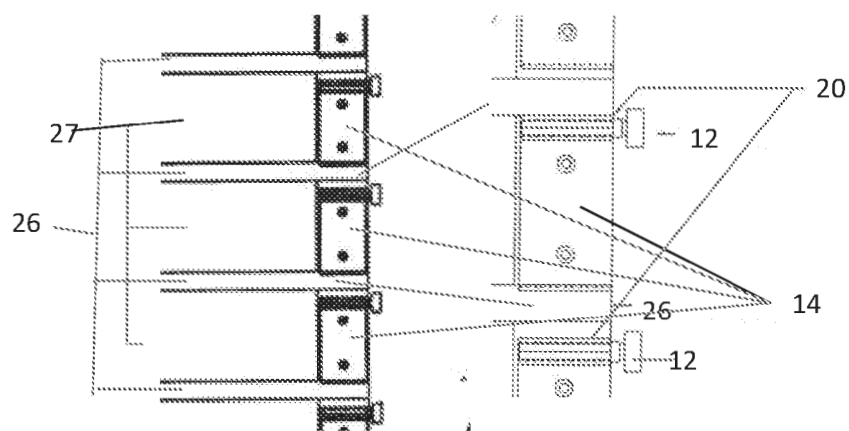


FIG. 6

US 2022/0169099 A1

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SINGLE PANEL ROLL-UP DOOR**BACKGROUND**

[0001] Various aspects of the present disclosure relate generally to a roll-up door, and specifically to a single panel roll-up door.

[0002] Tractor trailers, large containers, refrigerated containers, and the like normally have either one multi-panel roll-up door to secure the opening of the enclosure of the trailer; or contain a set of hinged doors; or contain a combination of the two sets of two doors having outside hinged doors and internal multi-panel roll-up door. The multi-panel roll-up door is prevalent in semi-truck trailers, storage containers, refrigerated trailers, garages, and aircrafts. The multi-panel roll-up door consist of multiple panels of corrugated metal, aluminum, or wood panels wherein the multiple individual panels are coupled together, by hinges, joints, or the like, to allow for the door to be lifted into an open position and lowered into a closed position.

[0003] There are two main types of multi-panel roll-up doors, multi-panel roll-up doors that roll upon itself on a drum and multi-panel roll-up doors that are coupled to guide tracks and follow the guide tracks along the ceiling of the container. Multi-panel roll-up doors that are on a drum although present the ease of use, reduce the internal clearing height of a trailer or container. Multi-panel roll-up doors that roll-up on guide tracks and rest flat against the ceiling provide better clearance but are heavy and can present a hazard when lowering.

[0004] In considerations for a tractor trailer roll-up door, and various implementations of a multi-panel roll-up doors, the door must be able to withstand the elements and abuse from heavy use. The multi-panel door has the structural integrity to withstand the opening and closing, assaults from forklifts, and the durability to withstand bumpy roads. Multi-panel roll doors are heavy and even the best multi-panel door still has seams that are susceptible to water intrusion. Multi-panel roll-up doors that have seals and joints to prevent water intrusion add to the overall weight of the roll-up door.

[0005] Therefore, a single panel roll-up door that is lighter than conventional roll-up doors, designed to withstand the elements, and eliminates water intrusion would be useful and advantageous.

BRIEF SUMMARY

[0006] According to aspects of the present disclosure, a single panel roll-up door, coupled to a framed opening, the framed opening comprising a right side and a left side, of a container, the container comprising a floor and a ceiling; wherein the single panel roll-up door comprising a single solid panel, roller brackets, and rollers; wherein the single panel roll-up door rollers are coupled to the left and right guide tracks of the framed opening of the container; and wherein the single panel roll-up door can be selectively raised to an open position and selective lowered into a closed position.

[0007] The panel, of the single panel roll-up door, comprising a top edge of the panel, a bottom edge of the panel, a left edge of the panel, a right edge of the panel, a front side of the panel, and a back side of the panel. Wherein, the back side of the panel having a surface comprising a first plateau, a first recessed channel, a plateau, a recessed channel, and a

last plateau. Wherein the first plateau comprising a top edge, a bottom edge, and a flat surface spanning an area longitudinal, from the left edge of the panel to the right edge of the panel, and perpendicular, from a top edge of the first plateau to the bottom edge of the first plateau, wherein the top edge of the first plateau meets with the top edge of the panel defining an edge therein. The first recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the first recessed channel, wherein the top ridge of the first recessed channel meets the bottom edge of the first plateau defining an edge therein. The plateau comprising a top edge of the plateau, a bottom edge of the plateau, and a flat surface spanning an area longitudinal, from the left edge of the panel to the right edge of the panel, and perpendicular, from a top edge of the plateau, wherein the top edge of the plateau meets with the bottom ridge of the first recessed channel, and the bottom edge of the plateau. The recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the recessed channel, wherein the top ridge of the recessed channel meets the bottom edge of the plateau, a bottom ridge of the recessed channel, and a channel of the recessed channel. The last plateau comprising a top edge of the last plateau, a bottom edge of the last plateau, and a flat surface of the last plateau, spanning an area longitudinal from the left edge of the panel to the right edge of the panel, and perpendicular, from a top edge of the last plateau, wherein the top edge of the last plateau meets the bottom ridge of the recessed channel, to the bottom edge of the last plateau, wherein the bottom edge of the last plateau meets the bottom edge the panel.

[0008] A left series of rollers, comprising rollers and roller brackets, are coupled to the left edge of the panel. The left series of rollers are coupled to the left edge of the panel and are coupled to the left guide track. Wherein the left series of rollers coupled to the left edge of the panel and coupled to the left guide track in a manner that allows the rollers to freely roll along the left guide track. The left guide track is coupled to the left series of rollers and coupled to the left side of the framed opening of the container.

[0009] The right series of rollers, comprising rollers and roller brackets, coupled to the right edge the panel. The right series of rollers coupled to the right edge of the panel are coupled to the right guide track. Wherein the right series of rollers coupled to the right edge of the panel and coupled to the right guide track in a manner that allows the rollers to freely roll along the right guide track. The right guide track being coupled to the right side of the framed opening of the container.

[0010] Wherein the left series of rollers move in the left guide track and the right series of rollers move in the right guide track, allowing the panel to be lifted in the opened position and lowered to the closed position. The left series and right series of rollers respectively traversing the left and right guide tracks. The course of the left and right guide tracks extending vertically form the floor of the container, the left guide track on the left side of the framed opening of the container and the right guide track on the right side of the framed opening of the container, to the ceiling of the container. When approaching the ceiling of the container, the guide tracks, bend at an arched angle back into the container following the course of direction of the ceiling into the container, allowing the panel, the left series of rollers and right series of rollers when in the opened position to rest in

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the guide tracks parallel in relation to the ceiling. Alternatively, when the panel is resting in the closed position the panel, the left series of rollers and the right series of rollers are perpendicular in relation to the ceiling and the floor of the container.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF DRAWINGS

[0011] FIG. 1 is a perspective view of a framed opening of a container, such as a container trailer for a semi-truck.

[0012] FIG. 2 is perspective view of a framed opening of a container, such as a container trailer for a semi-truck, illustrating the left and right guide tracks, the right roller series, rollers, and the panel resting in the opened state parallel to the ceiling of the container.

[0013] FIG. 3 is a view from the front of the panel, illustrating the front side of the panel, the top and bottom edges of the panel, and the left and right edges of the panel.

[0014] FIG. 4 is a view from the back side of the panel, depicting the first plateau, showing the top edge of the first plateau correlating to the top edge of the panel, the first recessed channel, the first recessed channel, the plateau, the recessed channel, the left and right series of rollers, the roller brackets, and the last plateau, having a bottom edge of the last plateau correlating to the bottom edge of the panel.

[0015] FIG. 5 is a view from the rear of the container, as illustrated a container trailer, showing the panel resting in the closed position within the framed opening of the container, and the locking mechanism selectively locked to the floor of the container.

[0016] FIG. 6 is a close up enlarge view of the back side of the panel illustrating the alternating series of plateaus and recessed channels, the rollers, the roller brackets, the edge stiffener, wherein the rollers, roller brackets, and edge stiffener are coupled to the plateau sections.

DETAILED DESCRIPTION

[0017] Aspects of the present disclosure provide for single panel roll-up door. Wherein the single panel roll-up door comprises a panel, roller brackets, and rollers. Wherein single panel roll-up door can be installed into framed opening of a container, wherein the framed opening of the container has left and right guide tracks for rollers. Wherein the roller brackets are coupled to the rollers, wherein a series of roller brackets and rollers define roller series. Wherein the panel has a left roller series and a right roller series. Wherein the left roller series are couple to the left edge of the panel of the single panel roll-up door and right roller series are coupled to the right edge of single panel roll-up door. Wherein the left and right roller series of the single panel roll-up door are coupled respectively to the left and right guide tracks of the framed opening. Wherein the guide tracks of the framed opening ascend vertically toward the ceiling of the container, and upon approaching the ceiling of the container, the guide tracks bend back within the container and continue parallel to the ceiling of the container, within the container. Wherein the single panel roll-up door can be selectively in an opened position or closed position. When in the opened position the panel rest in the guide tracks in parallel to the ceiling of the container of the framed opening.

[0018] Aspects of the present disclosure provide for the single panel roll-up door, wherein the panel, of the single

panel roll-up door, having a front side, a back side, a left edge, a right edge, a top edge and a back edge. Wherein the front side of the panel is a continuous smooth surface. Wherein the back side of the panel having a surface comprising a first plateau, a first recessed channel, a plateau, a recessed channel, and a last recessed channel. Aspect of the present disclosure provide for single panel roll-up door that replace conventional roll-up doors or the single panel roll-up door can be installed into new container builds.

[0019] Particularly, the single panel roll-up door as described herein can be configured to satisfy user-specified dimensions of the framed opening of a container. The user specific dimensions of the single panel roll-up door still allows the panel to be lighter than conventional roll up doors of the same dimensions. As well as the single panel roll-up door described herein, is a solid single panel, that is lighter than what is realized in conventional roll-up door technologies at comparable dimensions. In this regard, the single panel roll-up door describe herein is particularly well suited for applications for replacement of conventional roll-up doors and new installations of roll-up doors such as semi-trailer roll-up doors, container roll-up doors, storage container roll-up doors, refrigeration trailer roll-up doors, and the like.

[0020] Moreover, the single panel roll-up door described herein provides a single panel roll-up door with a front side, directed to the exterior of the container, comprising a continuous surface. The single panel roll-up door described herein is a single solid panel, and is suited to prevent moisture intrusion from the elements. For instance, in the application of a semi-truck trailer, the single panel roll-up door, described herein, provides a seamless door preventing any moisture and mold. A conventional semi-trailer roll-up door is composed of multiple individual panels that are coupled together to form the roll-up door, even the best coupling for the multiple individual panels still has seams or joints. However, the single panel roll-up door, described herein, is a solid seamless single panel.

[0021] Moreover, to attain the desired rigidity of the multiple panel roll-up door necessary for a typical semi-trailer to withstand the elements; conventional roll-up doors requires material that is of either wood, metal, or other material, or the combination of the like which are heavy. Comparatively, the single panel roll-up door described herein uses light-weight components but maintains the rigidity of industry standards of conventional roll-up doors with multiple panels.

[0022] Moreover, the single panel roll-up door described herein, having a rigid and durable integrity of a conventional roll-up door, still maintains a certain flexibility to withstand blunt force from the impact of a forklift. Conventional roll-up doors made of durable wood become damaged due to the lack of flexibility. The single panel roll-up door described herein, has the flexibility to withstand blunt force. Thus, the single panel roll-up door described herein, would be suited for applications such as semi-trailers, and the single panel roll-up door described herein would be advantageous over conventional roll-up doors.

[0023] Moreover, the single panel roll-up door herein can be configured to satisfy user-specified dimensions and depths and still be able to traverse the angled bend of industry standard guide tracks for a conventional multiple-panel roll-up door. The single panel roll-up door describe herein maintains its rigidity as well as can withstand the

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elements, and being lightweight can be configured to be thicker than conventional materials used in the industry. As an example advantage of the panel of the single panel roll-up door described herein, with increased thickness the panel of the single panel roll-up door can provide certain advantages of insulation more than conventional multi-panel roll up doors.

[0024] Moreover, previous challenges of creating such a single panel roll-up door that is suitable for semi-tractor trailers have failed due to limitations of materials. Previous attempts at creating such a single panel roll-up door have failed due to the inability to traverse the traditional guide tracks for roll up doors. Another reason previous attempts at a single panel roll-up doors have failed due to the inability to overcome the bending angle of the standard roll-up door guide tracks. Conventional materials lack the flexibility to be able to bend in order to be solid panel roll-up door. Conventional materials would need to be thin to achieve the flexibility the single panel roll-up door described herein has. Conventional materials needing to be thin would lose the durability, and would easily be penetrable; losing the benefits of security that conventional material maintain. Such conceptual attempts using conventional materials would leave material to thin leading to warping at the bend, or be such a material that could not withstand the harsh conditions from the wind and elements during travel. Such a thin material would not hold up the continual and constant use, and further would not hold up to the rough environment of over the road hauling. However, the panel of the single panel roll-up door described herein overcomes these obstacles as it can be configured to satisfy user-specified dimensions of height, width, and depth and still have the flexibility to traverse the angled bend of industry standard guide tracks for a conventional multiple-panel roll-up door. The panel of the single panel roll-up door describe herein maintains its rigidity as well as can withstand the elements, and being lightweight can be configured to be thicker. The panel of the single panel roll up door described herein, is composed of a material that is lightweight, rigid, flexible, and provides a security that is improved over conventional materials.

[0025] Moreover, multi-panel roll-up doors that are used typically have hinges or joints between panels to accommodate the bend of guide tracks. Such reasons are why conventional roll-up doors are made of multi-panels, often coupled together by hinges or joints, to allow for the roll up door to have both structural integrity and flexibility to traverse the angled guide tracks. However, the single panel roll-up door described herein overcomes the need to use a multi-panel jointed or hinged panels by having the flexibility to traverse the industry standard guide tracks without the need for hinged or jointed coupling and does not have multiple panels.

[0026] Moreover, the single panel roll-up door described herein is more cost efficient than conventional multi-panel roll-up doors, and can be utilized to replace conventional multi-panel roll-up doors. One example embodiment of the single panel roll-up door described herein can use the existing guide tracks of the existing multi-panel roll-up doors, and easily replace multi-panel roll-up doors.

[0027] Moreover, the single panel roll-up door described herein overcomes the limitations and shortcomings of the multi-panel roll-up door. In one aspect the single panel roll-up door maintains the ridged structure of the multi-panel roll up door without the need for multiple panels. In another

aspect, the single panel roll-up door described herein achieves the flexibility of multi-panel roll-up door without having multiple panels that are coupled by hinges or joints.

[0028] Moreover, some over-the-road hauling trailers have converted to tarps instead of either multiple-panel-roll up doors or conventional two panel swinging doors. The benefit of tarps are that they are cheap and easy to replace, however they do not provide any security to the contents within the trailer. In contrast, the panel of the single panel roll-up door described herein has the cost benefits of tarps but maintains the rigid structure of multi-panel roll-up doors and improves security of the contents within the trailer. As the panel of the single panel roll-up door herein has the rigidity of a multiple-panel door but a higher flexibility rate, which would increase security of the contents of the trailer. Further, the panel of the single panel single roll-up door, described herein, is of a solid material that resist easy penetration comprising of material that maintains its structural integrity.

[0029] Referring now to the drawings, and in particular to FIG. 1 a perspective view of the framed opening of the container, such as a container trailer for a semi-truck. FIG. 1 depicts the framed opening 1 of the container in which the single panel roll-up would be coupled to. Wherein the framed opening of the container comprising a left side 30, a right side 31, a top and a bottom. Wherein the container comprising a ceiling 2, a floor 3, a left wall of the container, and a right wall of the container.

[0030] Referring to FIG. 2, a perspective view of a framed opening of a container, such as a container trailer for a semi-truck, illustrating the left guide track 4 of the framed opening of the container, and a cut away view of the right guide track 5 framed opening of the container. Wherein, the left 4 and right 5 guide tracks of the framed opening of the container being respectively coupled to the left 30 and right sides 31 of the framed opening; wherein the left guide track 4 of the framed opening is coupled to the left side of the framed opening 30 and right guide tracks coupled to the right side of the framed opening 31, ascend to the ceiling of the container 2 and arching back within in the container. Wherein the left 4 and right 5 guide tracks would also be coupled to the container ceiling 2 for the panel 6 to rest in the opened position in parallel in relation to the container ceiling 2.

[0031] Wherein, the left guide track 4 are coupled to a left series of rollers 22 and the right guide tracks 5 are coupled to a right series of rollers 23. Wherein, the left series of rollers 22 coupled to the left edge of the panel 7 and the right series of rollers 23 are coupled to the right edge 9 of the panel 9. FIG. 2 illustrating a cut away view of the right guide track 5, with a view of the right series of rollers 23 within the right guide track 5 of the framed opening, the panel 6, and an indication of the rollers 12 of the right series of rollers 23. FIG. 2 depicts the single panel roll-up door installed within the framed opening of a container. FIG. 2 depicts the panel 6, coupled to the left 22 and right 23 roller series, wherein the left 22 and right 23 roller series are respectively coupled to the left 4 and right 5 guide tracks, wherein the left 4 and right 5 guide tracks are respectively coupled to the left 30 and right 31 sides of the framed opening. Wherein, the left 4 and right 5 guide tracks coupled respectively to the left 30 and right 31 sides of the framed opening ascend to the container ceiling and bend at an arch to continue along the ceiling 2 parallel with ceiling of the container. Wherein the

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panel 6, when resting in an opened position, rest parallel with the ceiling of the container 2. The single panel roll-up door having a panel 6 that is coupled to the left series of rollers 22, coupled to the left edge 9 of the panel, wherein the left series of rollers 22 are coupled to the left guide track 4, wherein the left guide track 4 is coupled to the left side 30 of the framed opening of the container and the ceiling of the container. Wherein the right series of rollers 23 coupled to the right edge 7 of the panel, and the right series of rollers 23 are coupled to the right guide track 5, and the right guide track 5 is coupled to the right side 31 of the framed opening and coupled to the ceiling of the container 2. Wherein, the left series 22 of rollers and the right series of rollers 23 are respectively coupled to the left 4 and right 5 guide tracks in a fashion that the coupling allows for the panel 6 of the single panel roll-up to be selectively raised and lowered.

[0032] FIG. 2 also illustrates another embodiment of the single panel roll-up door that could be installed as a replacement to a conventional multi-panel roll-up door within a container that has previously installed left 4 and right 5 guide tracks. Wherein the single panel roll-up door could be configured to be installed utilizing the existing guide tracks.

[0033] Referring to FIG. 3, a view from the front side 21 of the panel 6, illustrating the front side of the panel 21, the top edge of the panel 8, the bottom edge of the panel 10, the left edge of the panel 7, and the right edge of the panel 7. FIG. 3 illustrates the smooth continuous surface of the front side of the panel 21. Additional, FIG. 3 depicts that front of the panel 21, as a solid single panel.

[0034] FIG. 3 also illustrates another embodiment of the single panel roll-up door wherein the panel 6 comprises a thermoplastic composite. In another embodiment of the single panel roll-up door, the panel 6 comprises a multi-layer thermoplastic fibrous composite. Thermoplastic composites and multi-layer thermoplastic fibrous composites are well known in the industry, however, the innovation in utilizing such a material as a thermoplastic composite or a multi-layer thermoplastic fibrous composite as in described the single panel roll-up door herein are novel. In another embodiment of the single panel roll-up door certain aspects of the thermoplastic composite or multi-layer thermoplastic fibrous composite create the panel, wherein the panel could be comprised of fibrous material such as multi-layer fiber reinforced thermoplastic, fibrous material of glass, fibrous material of plastic, fibrous material of resin, fibrous material of fiberglass, or a combination thereof.

[0035] Referring to FIG. 4, a view from the back side of the panel 6, comprising a surface of a first plateau 11, a first recessed channel 24, a plateau 27, a recessed channel 28, a last plateau 25, a left series of rollers 22, and a right series of rollers 23.

[0036] Wherein the first plateau 11, comprises a top edge of the first plateau; a bottom edge of the first plateau; and a flat surface of the first plateau, spanning an area perpendicular from the top edge of the panel 8 to the bottom edge of the first plateau, and longitudinal from the left edge 9 of the panel 6 to the right edge 7 of the panel 6. Wherein the top edge of the first plateau 11 meets to the top edge 8 of the panel 6 defining an edge between the top edge of the first plateau and the top edge of the panel 8 and the bottom edge of the first plateau 24.

[0037] Wherein the first recessed channel 24, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the first recessed

channel and a bottom ridge of the first recessed channel, and a channel of the first recessed channel. Wherein the top ridge of the first recessed channel 24 meets the bottom edge of the first plateau 11 defining an edge line between the top ridge of the recessed channel and the bottom edge of the first plateau 11. Wherein the bottom ridge of the first recessed channel meets the top edge of the plateau 27. Wherein a space is defined between the top ridge of the recessed channel and the bottom ridge of the recessed channel, wherein the space creates the channel, and defining a corridor which of the first recessed channel. Wherein the channel of the first recessed channel is a grooved section, grooved into the back side of the panel with a depth not to exceed the thickness of the panel, and therein a channel is defined between the top ridge of the first recessed channel and the bottom ridge of the first recessed channel;

[0038] Wherein the plateau 27, a flat surface spanning an area perpendicular from the bottom ridge of the first recessed channel and longitudinal from the left edge 9 of the panel 6 to the right edge 7 of the panel 6. Wherein the plateau comprises a top edge of the plateau and a bottom edge of the plateau. Wherein the top edge of the plateau 27 meets with the bottom ridge of the first recessed channel 24 and defines an edge between the bottom ridge of the first recessed channel and the top edge of the plateau.

[0039] Wherein the recessed channel, spanning longitudinal from the left edge 9 of the panel 6 to the right edge 7 of the panel 6, comprising a top ridge of the recessed channel and bottom ridge of the recessed channel. Wherein the bottom edge of the plateau meets the top ridge of the recessed channel 28, and defines an edge with the bottom edge of the plateau and the top ridge of the recessed channel. Wherein the recessed channel comprises; a top ridge of the recessed channel, wherein the top ridge of the recessed channel meets with the bottom edge of the plateau, defining an edge between the top ridge of the recessed channel and the bottom edge of the plateau; a bottom ridge of the recessed channel; and a channel of the recessed channel, wherein, the channel of the recessed channel is a grooved section, grooved into the back side of the panel with a depth not exceed the thickness of the panel, and therein a channel is defined between the top ridge of the recessed channel and the bottom ridge of the recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel

[0040] Wherein the last plateau comprising a flat surface, spanning an area perpendicular, from the bottom edge of the recessed channel and bottom edge of the panel, and longitudinal, from the left edge 7 of the panel to the right edge 9 of the panel, comprising; a top edge of the last plateau 8, correlating to the bottom ridge of the recessed channel, and defining an edge between the bottom ridge of the recessed channel and the top edge of the last plateau; and a bottom edge of the last plateau 10, meet the bottom edge of panel 10 and defines an edge with the bottom edge of the last plateau and the bottom edge of the panel.

[0041] Wherein the left series of rollers 22, comprising rollers 12, coupled to the panel 6 on the left edge 9 of the panel. FIG. 4 depicts the left series of rollers 22 coupled to the back of the panel 6. The left series of rollers 22 that are coupled to the left edge 9 of the panel 6. The left edge of the left series of rollers 22 coupled to the left edge 9 of the panel are also coupled to the left guide track 4 in a manner that allows the rollers 12 to freely roll along the left guide track

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4. The left guide track 4 is coupled to the left side of the framed opening of the container.

[0042] Wherein the right series of rollers 23 are coupled to the panel 6 on the right edge 7 of the panel. The right series of rollers 23 are coupled to the right edge 7 of the panel 6. FIG. 4 depicts the right series of rollers 23 coupled to the back of the panel. The right series of rollers 23 are also coupled to the right guide track 5 in a manner that allows the rollers to freely roll along the right guide track 4. The right guide track 4 is coupled to the right side of the framed opening of the container.

[0043] FIG. 4 depicts an embodiment of the single panel roll-up door wherein the left series of rollers 22 and the right series of rollers 23 are coupled to the back side of the panel. The left series of rollers 22 coupled to the left edge of the panel 9 on the back side of the panel, and the right series of rollers 23 are coupled to the right edge 7 of the panel 6. The left series of rollers 22 are coupled to the left guide track. The left guide track 4 is coupled to the left side of the framed opening of the container. The right series of roller 23 are coupled to the right guide track, wherein the right guide track 5 is coupled to the right side of the framed opening of the container.

[0044] FIG. 4 depicts another embodiment of the single panel roll-up door comprising a series alternating plateaus and recessed channels 26. Wherein the series of alternating plateaus and recessed channels 26 comprising a first plateau 11, a first recess channel 13, a plateau 27, a recess channel 28, a plateau, a recess channel and continuing in alternating series of plateaus 27, recess channels 28 until meeting the user-specific length including the last plateau.

[0045] Wherein a last recessed channel in the alternating series of plateaus and recess channels meets the last plateau of the panel 15.

[0046] Wherein the last plateau comprising; a top edge of the last plateau, meeting the bottom ridge of the last recessed channel, and a bottom edge of the last plateau 15, correlating to the bottom edge of panel 10.

[0047] Wherein the top edge of the last plateau 15, would correlate with the bottom ridge of the last recess channel in the alternating series of plateaus 27 and recess channels 28 being determined by the dimensional length being user-specified in which the panel 6, in the closed position, close the opening of the framed container.

[0048] FIG. 4 depicts another embodiment of the single panel roll-up door comprising rollers 12 that are coupled to the panel 6 by a roller bracket 14. Wherein the roller 12 and the roller bracket 14 coupled to the backside of the panel in location to the first plateaus 11, the plateaus 27, and last plateau. Wherein the individual roller brackets comprise a coupling individually and respectively with the top and bottom edges of the first plateau, or plateaus, or the last plateau in relation to where each individual roller bracket is mounted relation to the first plateau, or the plateaus, or the last plateau. The roller bracket that is coupled to the first plateau, is coupled in such a manner that the roller bracket strengthens the top and bottom edges of the first plateau, or the top and bottom edges the plateaus, or the top and bottom edges of last plateau.

[0049] Referring to FIG. 5, a view from the rear of the container, as depicting an embodiment of the single panel roll-up door mounted within a container trailer, showing the panel 6 resting in the closed position within the framed opening 1 of the container.

[0050] FIG. 5 depicts an additional embodiment of the single panel roll-up door in comprising a locking mechanism 16. Wherein the locking mechanism 16 is coupled to the last plateau and allows the panel to be selectively locked to the floor of the container.

[0051] Referring to FIG. 6, is a close up enlarged view of the back side of the panel depicting an additional embodiment of the coupling of the rollers 12 to the panel 6. FIG. 6 illustrates the plateaus 27 and recessed channels 13, the rollers 12, the roller brackets 14, the edge stiffener 20, wherein the rollers 12, roller brackets 14, and edge stiffener 20 are coupled to the plateau 27. FIG. 6 illustrates the plateaus 27 and the recess channels 13, represent the alternating plateaus and recess channels 26 without the first plateau and the last plateau due to the close up view. Section

[0052] One embodiment of the single panel roll-up door is in which the panel 6 comprises a thermoplastic composite material. In another embodiment of the single panel roll-up door, the panel 6 comprises a multi-layer thermoplastic fibrous composite. In yet another embodiment of the single panel roll-up door is in which the panel 6 comprises light weight wood bi-product.

[0053] In an example implementation of the single panel roll-up door, the panel 6 has a length of one-hundred and eleven inches and a width of one-hundred inches. In another example implementation of the single panel roll-up door, the panel 6 has length as described by user specific needs and a width as described by user specific needs. In yet another example implementation of the single panel roll-up door, the panel 6 has a length of seventy two inches and a width of forty eight inches.

[0054] In an example implementation of the single panel roll-up door, the panel 6 has a thickness of up to $\frac{3}{8}$ ths of an inch. In another example implementation single panel roll-up door, the panel 6 has a thickness that may exceed one inch. In yet another example implementation of the single panel roll-up door, the panel 6 has a thickness of one fourth ($\frac{1}{4}$) of an inch. In yet another example implementation of the single panel roll-up door, the panel 6 has a thickness that can be specified by the user specified needs.

[0055] In an example implementation of the single panel roll-up door, the first plateau 11, a flat surface spanning an area perpendicular, from the top edge of the panel 8 to a bottom edge of the first plateau, and longitudinal from the left edge 9 of the panel 6 to the right edge 7 of the panel 6, comprising a top edge of the first plateau and the bottom edge of the first plateau; wherein the top edge of the first plateau 11 meets to the top edge 8 of the panel 6 defining an edge between the top edge of the first plateau and the top edge of the panel 8 and the bottom edge of the first plateau 24. The bottom edge of the first plateau meets with and wherein the distance between the top edge of the first plateau and the bottom edge for the first plateau 24 is a distance up to thirteen inches. In another example implementation of the single panel roll-up door, the first plateau wherein the distance between the top edge of the first plateau and the bottom edge of the first plateau 24 may have a distance that is less than thirteen inches. In yet another example implementation of the single panel roll-up door, the first plateau may have a distance between the top edge of the first plateau and the bottom edge of the first plateau 24 more than thirteen inches, dependent on user specific needs.

[0056] In an example implementation of the single panel roll-up door, wherein the first recessed channel 24, spanning

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longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the first recessed channel and a bottom ridge of the first recessed channel; wherein the top ridge of the first recessed channel **24** meets the bottom edge of the first plateau **11** defining an edge line between the top ridge of the recessed channel and the bottom edge of the first plateau **11**; wherein a space is defined between the top ridge of the recessed channel and the bottom ridge of the recessed channel; wherein the space creates the corridor if the first recessed channel; wherein the space between the top ridge of the recessed channel and the bottom ridge of the recessed channel up to one inch in distance. In another example implementation of the single panel roll-up door, wherein the space between the top ridge of the recessed channel and the bottom ridge of the recessed channel may exceed one inch. In yet another example implementation of the single panel roll-up door, wherein the space between the top ridge of the recessed channel and the bottom ridge of the recessed channel may be defined as to user specific needs.

[0057] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting for the disclosure. As used herein, the singular forms “a”, “an”, and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms “comprises” and/or “comprising,” when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0058] The corresponding structures, materials, acts and equivalents of all means or step plus function elements in the claims below are intended to include any structure, material, or act for performing the function in combination with other claimed elements as specifically claimed. The description of the present disclosure has been presented for purposes of illustration and description, but is not intended to be exhaustive or limited to the disclosure in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the disclosure. Aspects of the disclosure were chosen and described in order to best explain the principles of the disclosure and the practical application, and to enable others of ordinary skill in the art to understand the disclosure for various embodiments with various modifications as are suited to the particular use contemplated.

What is claimed:

1. A single panel roll-up door comprising a panel, roller brackets, and rollers, wherein the single panel roll-up door is installed into a framed opening of a container; wherein the panel of the single panel roll-up door comprises:

- a solid panel comprising a multi-layer thermoplastic fibrous composite wherein the panel comprises:
 - a top edge of the panel; and
 - a bottom edge of the panel; and
 - a left edge of the panel; and
 - a right edge of the panel; and
 - a front side of the panel; wherein the front side of the panel is a continuous surface; and
 - a back side of the panel;

wherein the back side of the panel having a surface comprising a first plateau, a first recessed channel, a plateau, a recessed channel, and a last plateau; wherein the first plateau comprising a top edge of the first plateau, a bottom edge of the first plateau, and a flat surface of the first plateau; wherein the flat surface of the first plateau spanning an area perpendicular from the top edge of the panel to the bottom edge of the first plateau, and spanning an area longitudinal from the left edge of the panel to the right edge of the panel; wherein the top edge of the first plateau meets with the top edge of the panel defining an edge therein; and

wherein the first recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprises a top ridge of the first recessed channel, a channel of the first recessed channel, and a bottom ridge of the first recessed channel;

wherein the bottom edge of the first plateau meets with the top ridge of the first recessed channel, defining an edge therein with the bottom edge of the first plateau and the top ridge of the first recessed channel,

wherein the channel of the first recessed channel is a grooved section, grooved into the back side of the panel with a depth not to exceed the thickness of the panel, and therein a channel is defined between the top ridge of the first recessed channel and the bottom ridge of the first recessed channel;

wherein the plateau comprises a top edge of the plateau, a bottom edge of the plateau, and a flat surface of the plateau;

wherein, the top edge of the plateau meets with the bottom ridge of the first recessed channel defining an edge therein;

wherein the flat surface of the plateau spans an area perpendicular, from the top edge of the plateau to the bottom edge of the plateau, and longitudinal, from the left edge of the panel to the right edge of the panel; and

wherein the recessed channel comprises: a top ridge of the recessed channel, wherein the top ridge of the recessed channel meets with the bottom edge of the plateau, defining an edge between the top ridge of the recessed channel and the bottom edge of the plateau; a bottom ridge of the recessed channel; and a channel of the recessed channel, wherein, the channel of the recessed channel is a grooved section, grooved into the back side of the panel with a depth not exceed the thickness of the panel, and therein a channel is defined between the top ridge of the recessed channel and the bottom ridge of the recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel; and

wherein the last plateau comprises: a top edge of the last plateau, wherein the top edge of the last plateau meets with the bottom ridge of the recessed channel defining an edge therein; a bottom edge of the last plateau, wherein the bottom edge of the last plateau meets with the bottom

US 2022/0169099 A1

Jun. 2, 2022

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edge of the panel and defines an edge therein; and the flat surface of the last plateau; wherein the flat surface of the last plateau spans an area perpendicular from the first edge of the last plateau and the bottom edge of the last plateau, and spanning an area longitudinal from the left edge of the panel to the right edge of the panel;

wherein roller brackets are coupled to the left edge of the panel, wherein rollers are coupled to the roller brackets that are coupled to the left edge of the panel; wherein the roller brackets and the rollers coupled to the left edge of the panel define a left series of rollers; wherein the left series of rollers are coupled to the left guide track of the framed opening; and

wherein roller brackets are coupled to the right edge of the panel, wherein rollers are coupled to the roller brackets that are coupled to the right edge of the panel; wherein the roller brackets and the rollers coupled to the right edge of the panel define a right series of rollers; wherein the right series of rollers are coupled to the right guide track of the framed opening;

wherein right series of rollers and the left series of rollers allow the single panel roll-up door to move along the guide tracks, wherein the single panel roll-up door can be selective opened and closed; wherein the single panel roll-up door when in the open position rest in the guide tracks in parallel to the ceiling of the container,

2. The single panel roll up door of claim 1, wherein the panel is comprised of a thermoplastic composite.

3. The single panel roll up door of claim 1 or 2, wherein the panel dimensions, width of the panel, thickness of the panel, and length of the panel are specified by user specific dimension of the framed opening of the container; wherein the back of the panel comprises a first plateau, a first recessed channel, and alternating series of plateaus and recessed channels, depending on user specific length, and a last plateau.

4. The single panel roll-up door of claim 1, 2, or 3, wherein the panel is coupled to a locking mechanism, and the locking mechanism is coupled to the bottom edge of the panel adapted to be selectively coupled to the floor of the container to lock the roll-up door in the closed position.

5. The single panel roll-up door of claim 1, 2, or 3 wherein the top edge of the panel is reinforced by a strengthening strip, the bottom edge of the panel is reinforced by a second strengthening strip, the right edge of the panel is reinforced by a third strengthening strip, and the left edge of the panel is reinforced by a fourth strengthening strip.

6. The single panel roll-up door of claim 1, 2, or 3 wherein the left series of rollers, comprising rollers, and the right series of rollers, comprising rollers are coupled to the back side of the panel with roller brackets; wherein, the roller brackets are coupled respectively to the left and right edges of the panel coupled to the portions of the back side of the panel designated as first plateau, plateau, and last plateau; wherein, the roller brackets are coupled with the top and bottom edges of the first plateau, the top and bottom edges of plateau, and top and bottom edges of the last plateau in a manner that strengthens the top and bottom edges of the first plateau, the plateaus, and the last plateau.

7. The single panel roll-up door of claim 1, 2, or 3 wherein the left series of rollers, comprising rollers and roller brackets, and the right series of rollers, comprising rollers and roller brackets, wherein the left and right series of rollers are respectively coupled to in a manner that allows the rollers to freely roll along the right the left and right guide tracks of the framed opening in manner that allows the single panel roll-up door to have a selective opened position and selective closed position; wherein in the selective open position the single panel roll-up door traverses the guide tracks extending vertically form the floor of the container, the left guide track on the left side of the framed opening of the container and the right guide track on the right side of the framed opening of the container, to the ceiling of the container, approaching the ceiling of the container; wherein the guide tracks, approaching the container ceiling, bend at an arched angle back into the container following the course of direction of the ceiling into the container, allowing the panel in the opened position to rest, within the container, in the guide tracks parallel in relation to the ceiling, and alternatively when the panel is resting in the closed position to be perpendicular in relation to the ceiling and the floor of the container.

* * * * *

EXHIBIT 5



PATENTS • TRADEMARKS • COPYRIGHTS • INTELLECTUAL PROPERTY LITIGATION

Richard A. Sharpe
rsharpe@pearne.com

J. Gregory Chrisman
gchrisman@pearne.com

June 6, 2023

Via Electronic Mail and Federal Express
Return Receipt Requested

Andrew Barnes, Esq.
Law Office of Andrew R. Barnes, LLC
5759 Sebastian Lane
Liberty Township, OH 45011

Andrew Barnes, Esq.
7634 Township Line Road
Waynesville, OH 45068

Flanagan Liebermann & Rambo
Attn: Andrew Barnes, Esq.
10 N. Ludlow St., Suite 200
Dayton, OH 45402

Re: Notice of Joint Inventorship of U.S. Pat. Appl. No. 17/676,144 (Pub. No. 2022/0169099
A1) to Phlipot et al.
Our Ref. RIDGE.J9651

Dear Sirs,

This firm represents Ridge Corporation (“Ridge”) in connection with its intellectual property matters. Ridge’s products include composite materials such as panels for use in trucks and trailers. Through Ridge’s previous work on a single-panel composite door it became aware of U.S. Patent Nos. 9,151,084 and 10,066,434, both of the same patent family, to Cold Chain, LLC. By now you are likely aware that Ridge cited the first of these patents (i.e. the ‘084 patent) in the above-noted patent application by way of a third-party submission under 37 C.F.R. §1.290. The purpose of that submission was to fulfill Ridge’s duty of candor before U.S. Patent & Trademark Office pursuant to 37 C.F.R. §1.56 because it has been determined that Ridge personnel are joint inventors of subject matter claimed in the ‘144 application.

More specifically, documents establish that by the time Jeff Phlipot of Kirk National Lease Co. (“KNL”) approached Ridge in October 2018 about panels for a potential roll-up door application, Ridge had already developed its “living hinge” technology based on the ability of

Exhibit 5

June 6, 2023

Page 2 of 2

Ridge's composite materials to be engineered for various bending applications including trailer air foils and roll-up doors. Based on Ridge's understanding of the living hinge concept and the material properties of its panels and skins, including with prior truck door applications, it became apparent that Ridge could employ its living hinge concept to engineer a single panel roll-up door for KNL's application. Thereafter, working with KNL to understand its specific application requirements, Ridge engineered and produced drawings for a single panel roll-up door employing the living hinge concept to enable the door to effectively bend around the tight radius required by KNL's application. Because the documents corroborate that Ridge contributed to both the conception and reduction to practice of its living hinge technology for KNL's roll-up door application, it is our opinion that Ridge employees are joint inventors of subject matter presently claimed in the '144 patent application. Indeed, Mr. Phlipot effectively acknowledged Ridge's inventive contribution in his email of July 23, 2021, requesting a meeting to start the paperwork to "lock this down. Patent, I.P."

As you are aware, 35 U.S.C. §115 requires that an application for patent *shall* include, or be amended to include, the name of the inventors for any invention claimed in the application. Because the Office automatically presumes that the named inventors in an application are the actual inventors, and considering the above information, we believe that the inventorship of the '144 application should be promptly corrected to comply with the requirements of inventor naming under U.S. patent law. The USPTO provides the ability to file a request to correct inventorship under 37 C.F.R. §1.48 and, if inventorship is not corrected, the Office personnel are to reject the claims of the application under 35 U.S.C. §101 and §115, as appropriate. As you can appreciate, intentional failure to correct the fundamental issue of inventorship can jeopardize the enforceability of a patent.

In view of the above, we request that you contact us within fourteen (14) days of the receipt of this letter to begin the process of correcting the inventorship of the '144 patent application. If we do not hear from you within fourteen days, we will assume that you do not intend to correct inventorship as required and will advise our client in the pursuit of further legal recourses. We look forward to your anticipated cooperation in this matter.

Please contact us if you have any questions.

With regards,

Very truly yours,



Richard A. Sharpe



J. Gregory Chrisman

RAS/JGC/rpk

cc: Ridge Corporation

EXHIBIT 6

From: [Andrew Barnes](#)
To: [Richard A. Sharpe](#); [Greg Chrisman](#)
Subject: U.S Pat Application No. 17/676144
Date: Friday, June 30, 2023 8:46:44 PM
Attachments: [Outlook-fepnob2e.png](#)

Richard A. Sharpe
J. Gregory Chrisman
Pearne Gordon
1801 East 9th Street, Suite 1200
Cleveland, OH 44114-3108

Dear Sirs:

As stated in my brief telephone conversation with Mr. Chrisman, held on June 20, 2023, I am following up to your letter of June 6, 2023, and our subsequent phone call, in particular to the claim that "Ridge employees are joint inventors of subject matter claimed in the '144 patent application [U.S. Pat. Appl. No. 17/676, 44]." During our conversation, we discussed that Ridge would provide documentation evidence of inventorship, and that until any valid documentation is provided a meaningful response to the June 6, 2023 letter could not be informatively responded too. As such, Mr. Chrisman stated that after touching base with Ridge, he would provide any documentation in support of any inventorship. I have yet to receive any additional documentation.

Mr. Phlipot disagrees with your assessment and specifically disputes that Ridge contributed either to the conception or reduction to practice of the invention claimed in the '144 application. He also did not "acknowledge Ridge's inventive contribution in his email of July 23, 2021" as stated in your letter. Therefore no correction of inventorship is needed or appropriate under 37 C.F.R. § 1.48.

Further, it has come to my attention that letters have been sent to multiple parties that have failed to state any inventorship interest in the current patent application subject of this letter. However, it seems to appear that the letters are an attempt to pressure Jeff Phlipot in these matters.

If you have any additional information that you believe corroborates the claim of inventorship, feel free to provide it to me. However, there is at present no basis for such a claim.

Andrew R Barnes, Esq.
Associate of Flanagan, Lieberman, & Rambo



****Licensed to practice in Ohio, and registered Patent Attorney***

Flanagan, Lieberman, & Rambo
10 N. Ludlow St., Ste. 200
Dayton, OH 45402

937.223-5200 Office
937.223.3335 Fax

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EXHIBIT 7

From: [Greg Chrisman](#)
To: [Andrew Barnes](#); [Richard A. Sharpe](#)
Cc: [Rachel P. Koll](#)
Subject: RE: U.S Pat Application No. 17/676144
Attachments: [image001.png](#)
[image002.png](#)
[Inventorship-US 2022-0169099.pdf](#)

Dear Mr. Barnes,

As we discussed in our telephone conversation you noted below, attached is evidence in support of Ridge's inventorship for your review. In light of the attached evidence, we disagree with Mr. Philipot's assessment that Ridge did not contribute either to the conception or reduction to practice of the invention claimed in the '144 application.

With regard to the other letters sent, those letters addressed a separate matter that has nothing to do with determining the correct inventorship of the '144 application. Thus, there was no reason to either mention or address the inventorship of the '144 application in those other letters.

Should you have any questions or wish to discuss the attached evidence, please let us know.

With best regards,

Greg Chrisman

Partner

E-mail-Signature-Cleveland-Gray-Pantone-423C



From: Andrew Barnes <barnes@flrlegal.com>

Sent: Friday, June 30, 2023 8:46 PM

To: Richard A. Sharpe <rsharpe@pearne.com>; Greg Chrisman <gchrisman@pearne.com>

Subject: U.S Pat Application No. 17/676144

Richard A. Sharpe

J. Gregory Chrisman

Pearne Gordon

1801 East 9th Street, Suite 1200

Cleveland, OH 44114-3108

Dear Sirs:

As stated in my brief telephone conversation with Mr. Chrisman, held on June 20, 2023, I am following up to your letter of June 6, 2023, and our subsequent phone call, in particular to the claim that "Ridge employees are joint inventors of subject matter claimed in the '144 patent application [U.S. Pat. Appl. No. 17/676, 44]."

During our conversation, we discussed that Ridge would provide documentation evidence of inventorship, and that until any valid documentation is provided a meaningful response to the June 6, 2023 letter could not be informatively responded too. As such, Mr. Chrisman stated that after touching base with Ridge, he would provide any documentation in support of any inventorship. I have yet to receive any additional documentation.

Mr. Phlipot disagrees with your assessment and specifically disputes that Ridge contributed either to the conception or reduction to practice of the invention claimed in the '144 application. He also did not "acknowledge Ridge's inventive contribution in his email of July 23, 2021" as stated in your letter. Therefore no correction of inventorship is needed or appropriate under 37 C.F.R. § 1.48.

Further, it has come to my attention that letters have been sent to multiple parties that have failed to state any inventorship interest in the current patent application subject of this letter. However, it seems to appear that the letters are an attempt to pressure Jeff Phlipot in these matters.

If you have any additional information that you believe corroborates the claim of inventorship, feel free to provide it to me. However, there is at present no basis for such a claim.

Andrew R Barnes, Esq.

Associate of Flanagan, Lieberman, & Rambo



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INVENTORSHIP OF U.S. APPL. NO. 17/676,144 (2022/0169099)

Below is a brief timeline and sample evidence of some of Ridge's work with fiber-reinforced composites and panels and incorporation of a "living hinge" to accommodate bending of a panel. Also presented below is Ridge's incorporation of this technology to the door concept brought to them by KNL, which resulted in Ridge developing a definite design to make the door concept an operative single panel roll door that is the subject of the '144 patent application.

An idea or concept alone is not enough in and of itself to be a patentable invention. Rather, the idea must be combined with ability to carry it out to fruition. Legally, "[c]onception is the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice." *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 1986).). Because an invention must be complete and operative, the inventor must be able to make a disclosure which would enable a person of ordinary skill in the art to construct or use the invention without extensive research or experimentation. This was not the case when KNL approached Ridge. As evidenced below, Ridge contributed its know-how to turn the door concept into a complete and operative invention as required. In doing so, Ridge made an inventive contribution to the claimed single panel roll-up door as is an inventor.

General Timeline: Relevant work by Ridge on flexible composite panels and interaction with KNL

2013 - Living Hinge Work

- Ridge works on the use of a living hinge for a truck trailer and door
- Portion of PowerPoint presentation

Ridge Presentation.... Saved to P: Drive... Greg Chris... ZC


File Edit View Help

Design Transitions Animations Slide Show Review View Help

careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

Next Steps

- Build Next Gen Tail with Ridge materials and [REDACTED] living-hinge concepts (higher melt temp webbings than FRP panels).
- Further refine double action spring-hinge universal attachment system for integration to back of tail panels and door face.
- Develop over-center top-panel brace of thicker stock Ridge material (welded-in living-hinges incorporated). Tie in retention [REDACTED]



- GTX- Gap Tail Cross-Over for Roll-up Door

- Ridge files Provisional Application No. 61/860,692 on July 31, 2013 for a device for reducing aerodynamic resistance
 - o The device uses glass reinforced plastic composite material having hinge lines for folding and then returning to their original shape
 - o Quotes from provisional application

serves to redirect the wake airflow at rear end of the vehicle when the vehicle is in motion into two opposing vortices which serve to reduce aerodynamic drag. In aspects, the airfoils are made of flat sheets of pliable and resilient material capable of bending and automatically returning to an original shape. The sheets are configured so that when the rear doors are opened the sheets collapse between the sides of the vehicle and the doors allowing the doors to swing into an open position generally parallel to the sides of the vehicle.

Referring now to the drawings in detail and

Figures 1, 2, and 3 illustrate the embodiment of the device comprises a pair of vertical airfoils 104, each of which is made up of a flat sheet of a light weight resilient material, such as glass reinforced plastic composite, swingably attached to opposite corners (or sides) of the vehicle by hinges or other pivotable points, which can be fastened to the door by bolts rivets welding or other fastening means. A horizontal flat sheet 104 is made of light

An opening sequence of this embodiment is illustrated in figures 15-18. It is to be understood that this opening sequence is similar to the previously described embodiment (e.g., without a top horizontal panel). As can be seen in the figures, the horizontal panel(s) (top and mid-point) can be equipped with a hinge line so as to effect folding into a collapsible manner. Further, as shown, actuators (e.g., air, hydraulic, springs, etc.) can be employed on the horizontal panels to as to effect

6

middle to enable swing doors to open.

4. The device of claim 1, wherein the sheets are connected to the body by hinges to enable folding against the door, and wherein the hinges are at least one of mechanical or living hinges.
5. The device of claim 1, wherein the horizontal sheets are connected to the vertical sheets by

FIG. 3

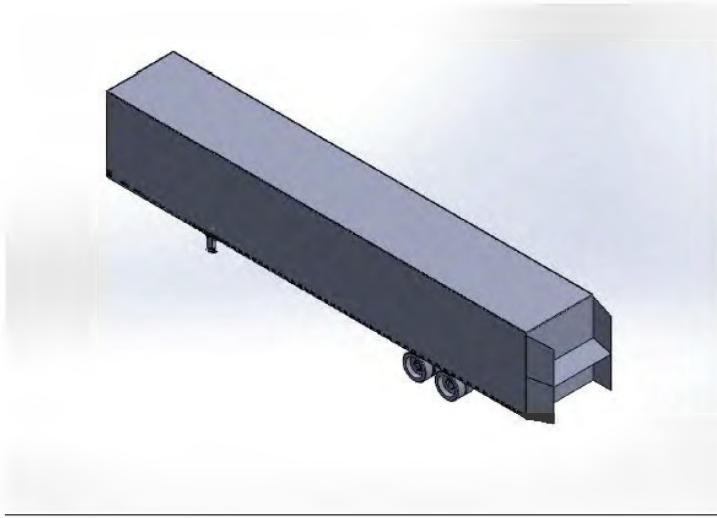
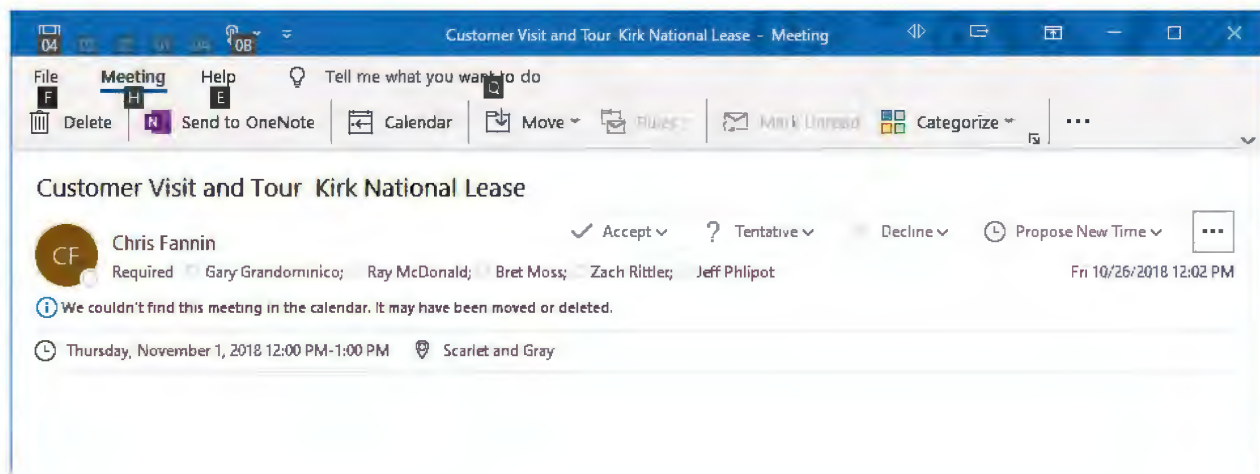
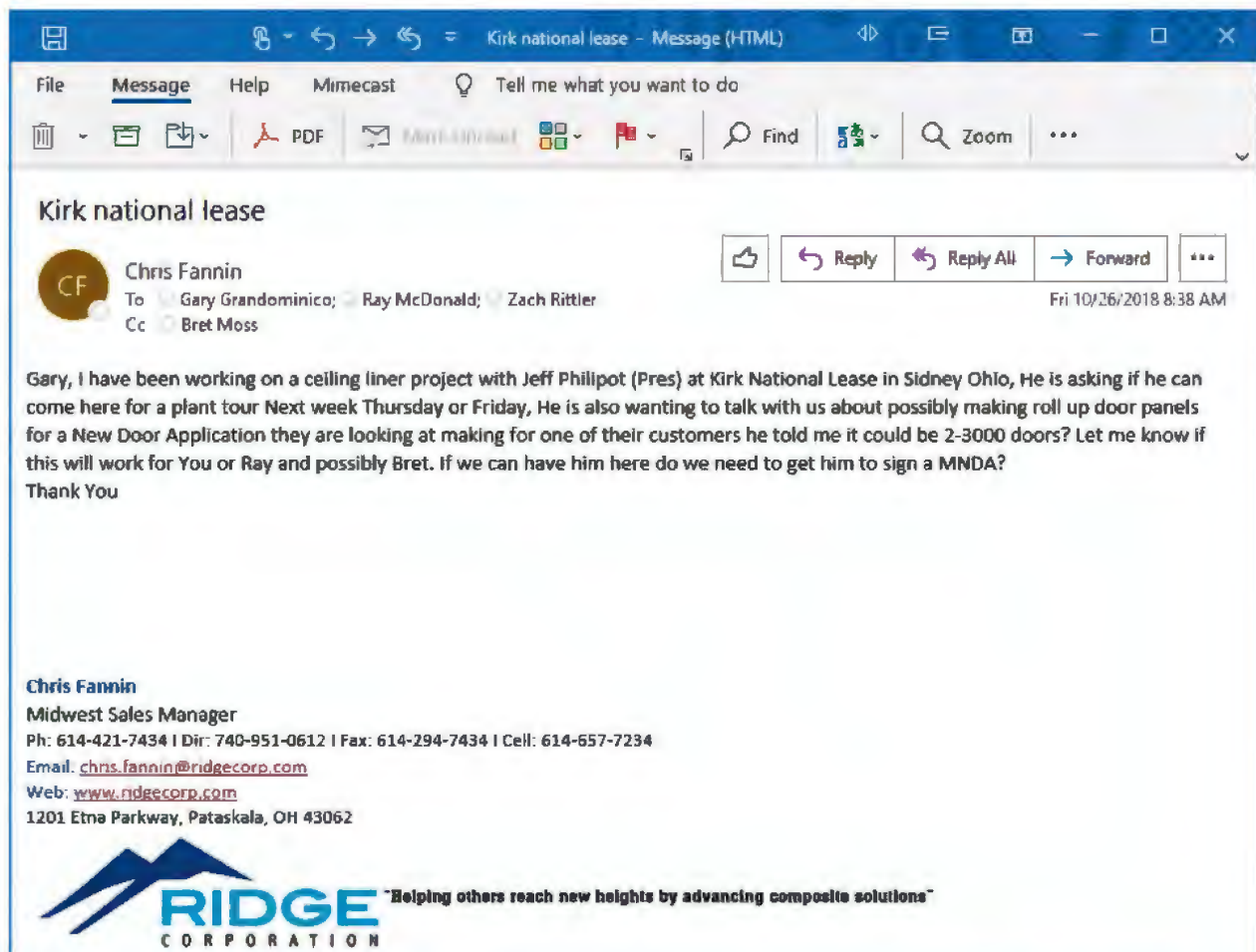


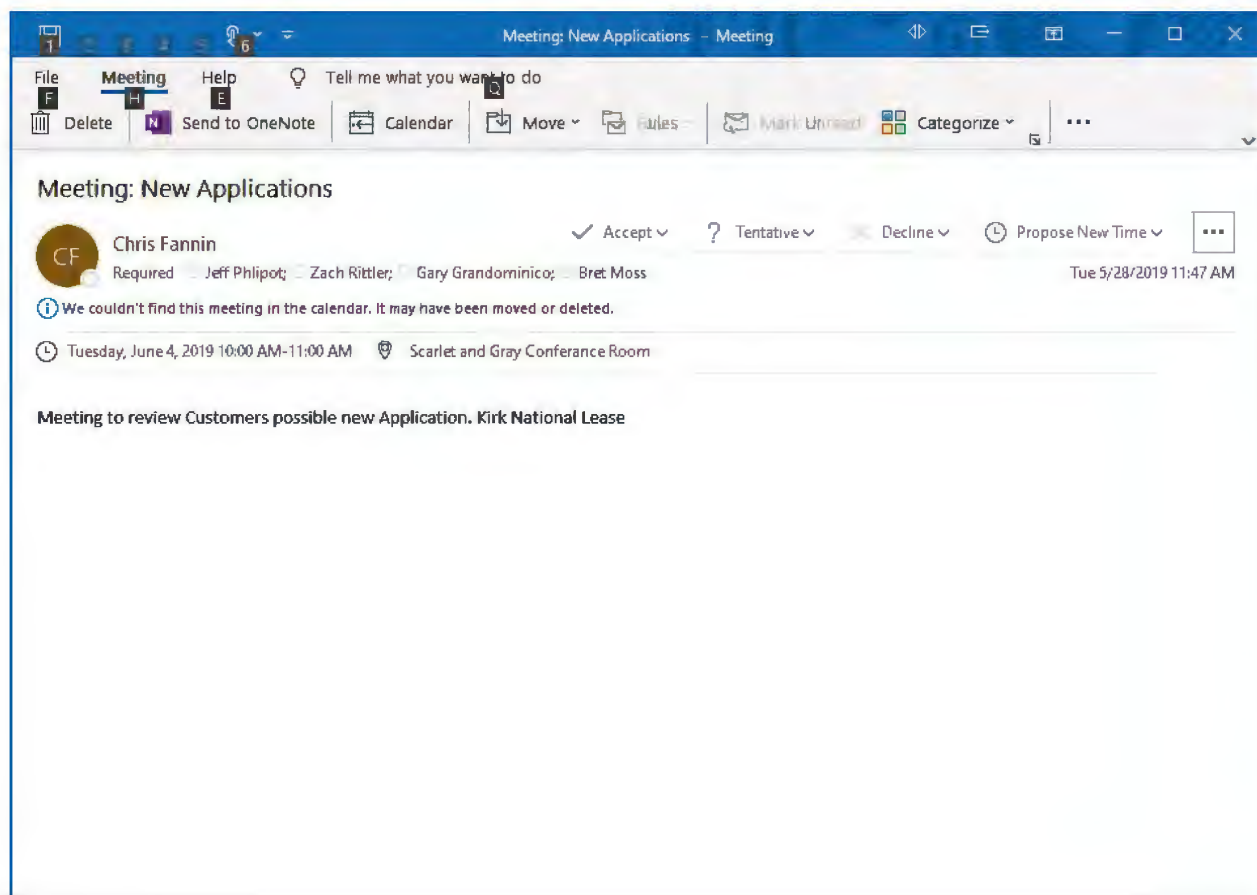
FIG. 15



October 2018 – First contact with KNL

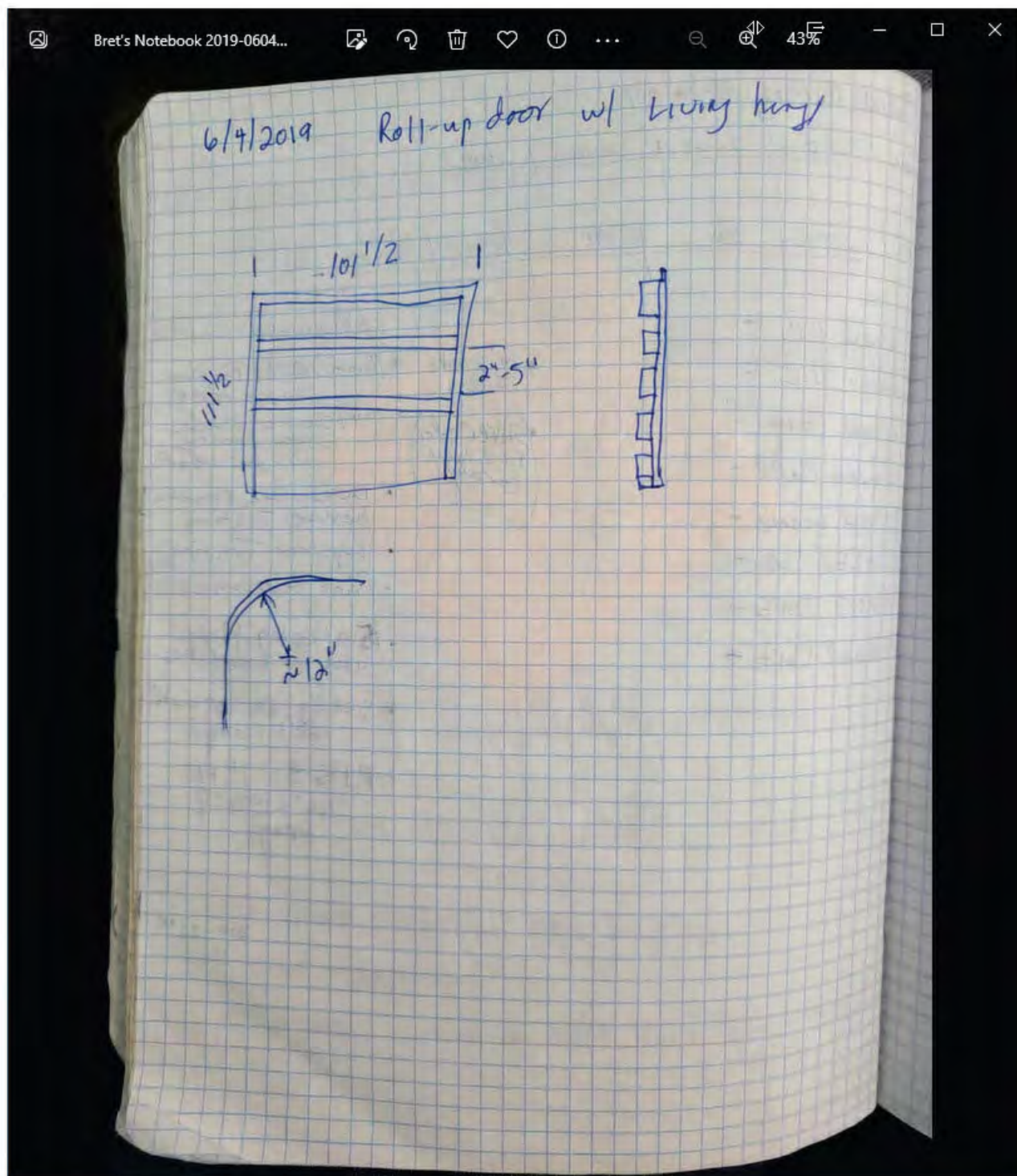


June 4, 2019 – Additional meeting with KNL about new door application

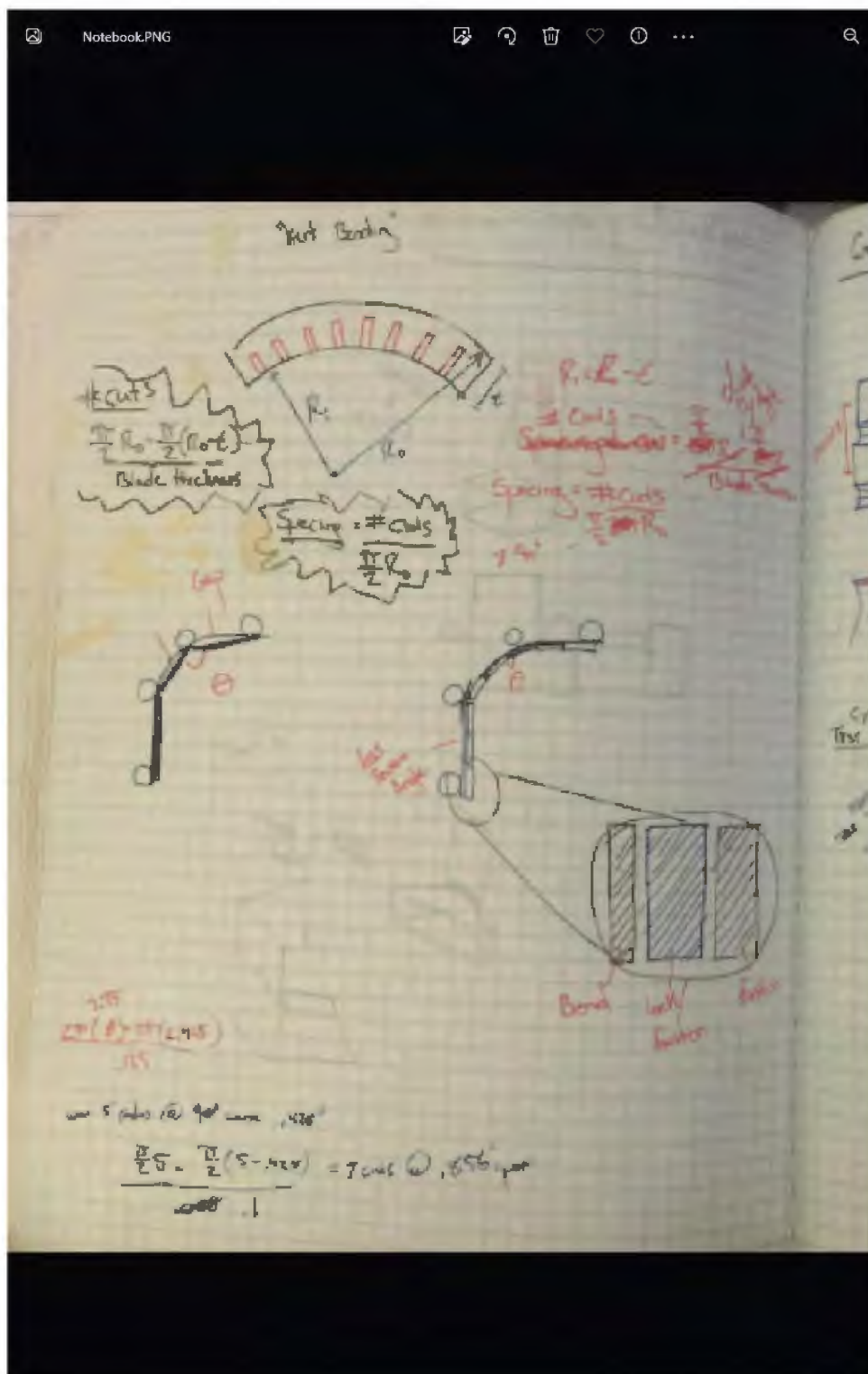


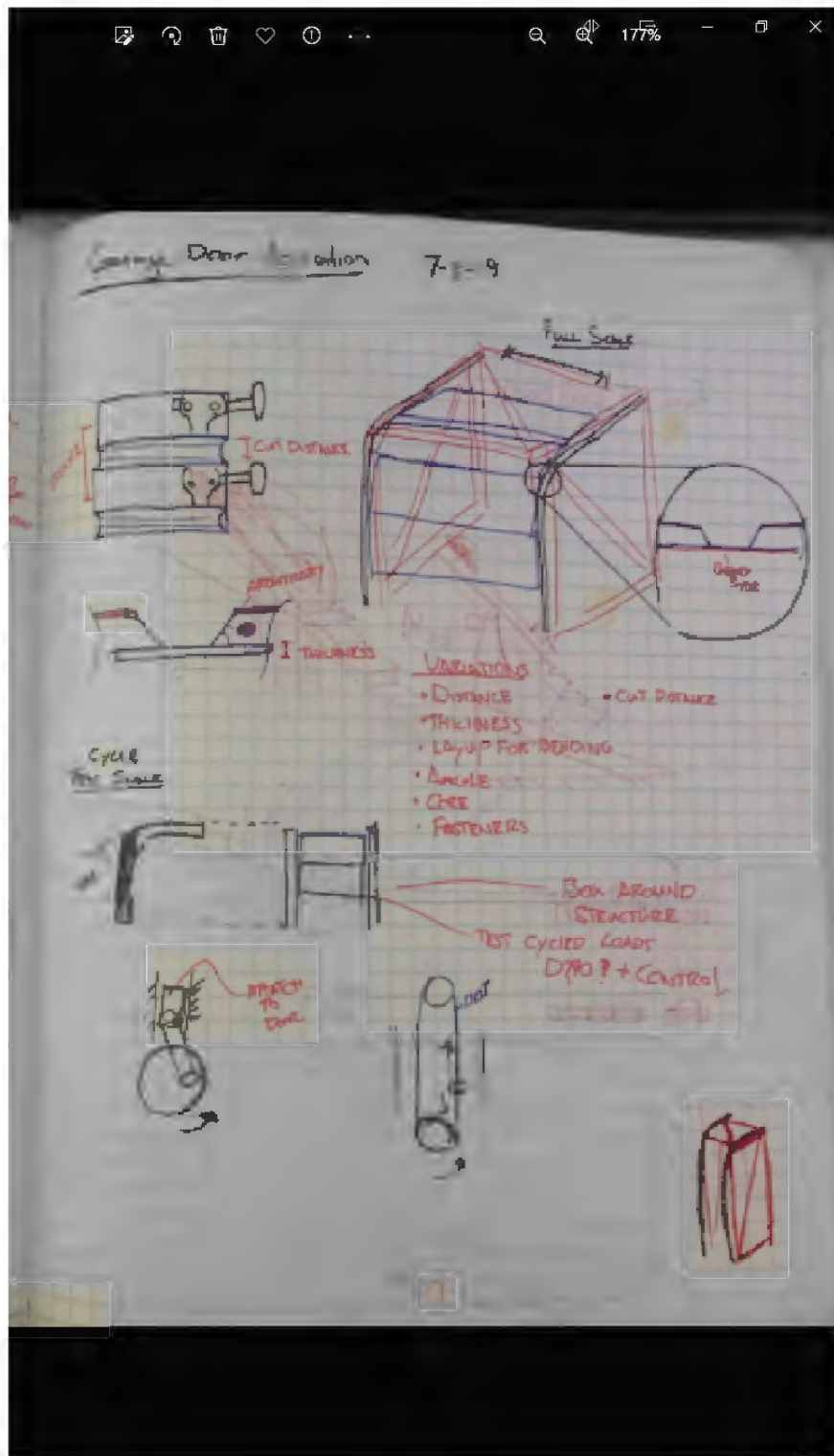
June 4, 2019 – Ridge develops details for door application using living hinge knowledge

-Bret Moss notebook page dated 6/4/19 – drawing titled “Roll-up door w/living hinge”

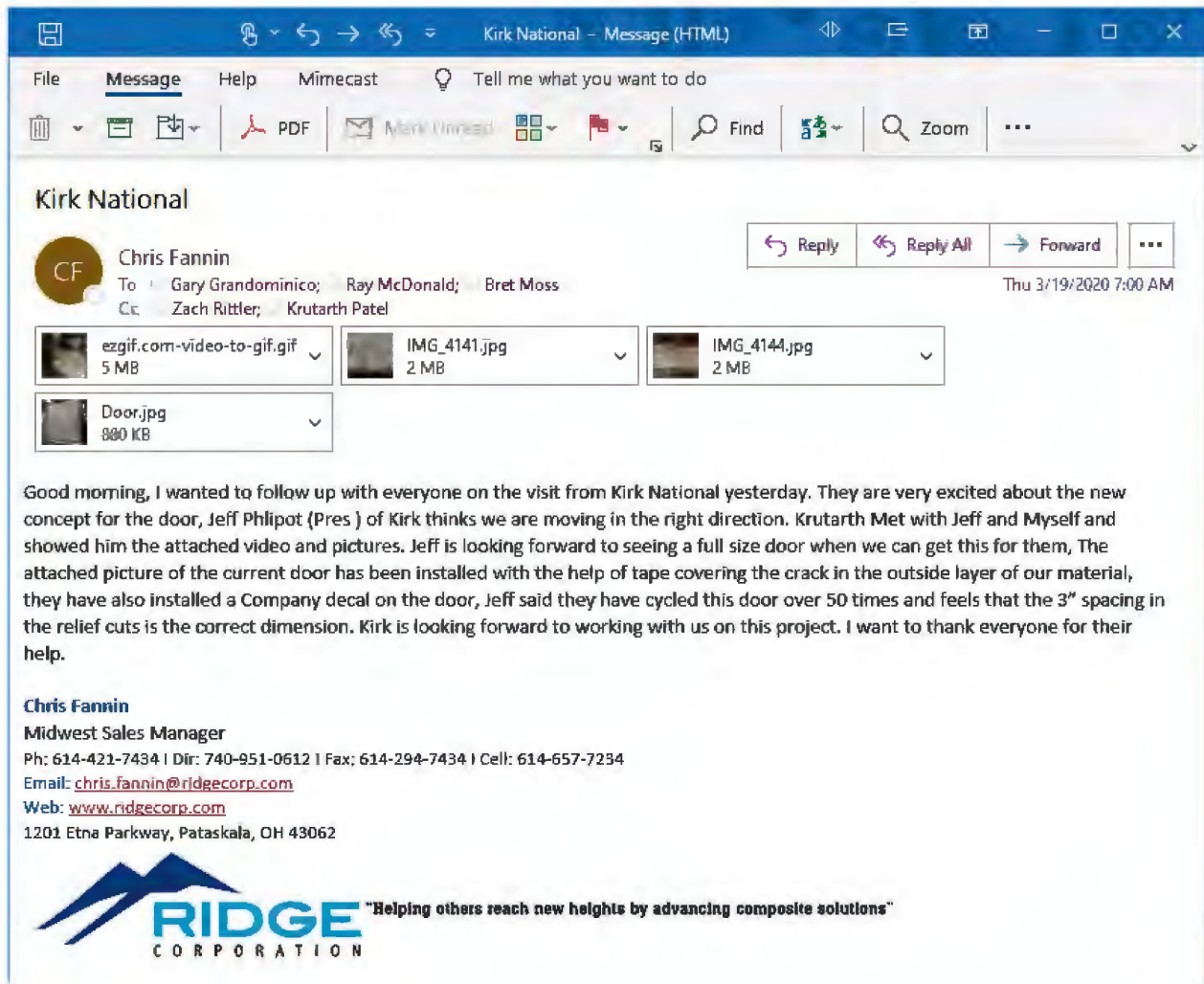


July 8, 2019 – Ridge Notebook titled “Garage Door Application”





March 19, 2020 – Fannin email re: KNL meeting



July 23, 2021 – KNL email to Gary – Door working great. Let's start paperwork to lock this down "Patent, I.P.,"

From: Jeff Philpot <Jeff_Philpot@knl.cc>
Sent: Friday, July 23, 2021 3:30 PM
To: Gary Grandominico
Subject: Rollup door

Gary, good afternoon.

After many attempts we have the rollup door working. Actually it works great. Would like to sit down with you to start the paper work to lock this down. Patent, I.P., Let me know a day and time that works for you.

Jeff Philpot | CEO
Kirk NationalLease Co.
3885 W. Michigan Ave. Sidney, OH 45365
(937.498.1151 | www.knl.cc
Follow us on Facebook



October 8, 2021 – KNL email to Gary – Thanks for support in helping me get this door product to where it is today

-“We value Ridge and the quality of your products which helped bring my concept of a new door to reality”

From: Jeff Philpot <Jeff_Philpot@knl.cc>
Sent: Friday, October 8, 2021 9:45 AM
To: Gary Grandominico; Ray McDonald; Zach Rittler; Chris Fannin; Bret Moss
Cc: schnelec@woh.rr.com; Larry Philpot; Kris Philpot; John Garmhausen
(jgarmhausen@fgks-law.com)
Subject: Kirk NationalLease - Ridge Corporation - Meeting Request

Good morning.

Thank you for all of your support, so far, in helping me get this door project to where it is today. We value Ridge and the quality of your products which helped bring my concept of a new door to reality. We can finally see the future and would like to sit down with you to discuss a long-term formal relationship.

We are excited that the door project is working out and look forward to getting it out on the market.

We are looking at Thursday, October 28th, at our office in Sidney, Ohio. Could you please let us know what time works best for all of you? We will then send out a meeting invite.

Our Corporate Attorney will be in attendance to help speed up the arrangement, which allows us to move forward as quickly as possible.

Look forward to hearing from you.

Thank you.

Jeff Philpot | CEO
Kirk NationalLease Co.
3885 W. Michigan Ave. Sidney, OH 45365
(937.498.1151 | www.knl.cc
Follow us on Facebook



EXHIBIT 8



Patented Single Panel Roll Door.

Tested.

Ultra Lightweight.

Market Ready Q3 2023

Contact Us for Demo or Pre-Order:
937.539.4843

- ✕ No Interior Hinges that will wear & rust
- ✕ No Unsightly Panel Gaps to Collect Grime
- ✕ Ease of Decal/Wrap Installation
- ✕ Over 100,000 Cycles in a Test Stand with Zero Signs of Fatigue
- ✕ Dozens of Doors in the Pilot Phase with Numerous Fleets



Contact Us for Demo or Pre-Order:

937.538.4840

- ✕ Patented Single Panel Design
- ✕ Extremely Lightweight @ appx 120lb with hardware
- ✕ Ease of Operation (reduce driver fatigue or complaints)
- ✕ FDA Approved Materials Throughout



Contact Us for Demo or Pre-Order:

937.538.4840

EXHIBIT 9

PEARNE GORDON

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Richard A. Sharpe
rsharpe@pearne.com

J. Gregory Chrisman
gchrisman@pearne.com

June 6, 2023

Via Electronic Mail and Federal Express
Return Receipt Requested

Jeff Phlipot, CEO
Kirk NationalLease Co.
3885 W. Michigan Ave.
Sidney, OH 45365

Truck & Trailer Parts Solutions Inc.
3858 W. Michigan Ave.
Sidney, OH 45365

John M. Garmhausen
FGKS Law
100 South Main Avenue
Suite 300
Sidney, Ohio 45365

Re: Notice of U.S. Patent No. 9,151,084
Our Ref. RIDGE.J9650

Dear Sirs,

This firm represents Ridge Corporation (“Ridge”) in connection with their respective intellectual property matters. Ridge’s products include composite materials such as Transcore® panels for use in trucks and trailers. Through Ridge’s previous work on a single-panel composite door it became aware of patents owned by Cold Chain, LLC. Ridge is the exclusive licensee of U.S. Patent Nos. 9,151,084 and 10,066,434 to Cold Chain, LLC. Of note, the claims of the ‘084 patent cover single-panel, roll-up doors for use in trucks, trailers and buildings, along with methods for providing the single-panel, roll-up doors on tracks for moving the doors. A copy of the ‘084 patent is attached as Exhibit A.

It has come to our client’s attention that Truck & Trailer Parts Solutions Inc. (“TTPS”) and/or Kirk NationalLease Co. (“KNL”) is offering for sale and selling a single panel roll door in the United States, for example, as pictured in the attached Exhibit B, that infringes one or more

claims of the '084 patent. Specifically, the single panel roll door is designed to flexibly roll open and closed in tracks having a radius of curvature to cover a door opening, for instance, an opening in a truck or trailer. The door has wheels attached to allow the door to fit into the tracks for guiding the door during opening and closing. Further, the single panel roll door has a first outermost surface formed by membrane having fibers and a sheet of foam attached to the membrane that forms a second outermost surface. Accordingly, the single panel roll door infringes one or more claims of the '084 patent.

Our client is not interested in fostering a protracted dispute with TTPS and KNL, but rather a commercial solution is more desirable. If TTPS and KNL will agree to (i) cease offering for sale and selling the infringing product and (ii) provide us with an accounting of past sales, then our client is willing to negotiate a settlement incorporating a release of its claims and any other mutually-acceptable terms. Because our client is interested in a mutually beneficial business solution, to facilitate a settlement Ridge is willing to offer a sublicense for the Cold Chain patents along with supplying TTPS and KNL with Ridge's high quality Transcore® panels so any future door products are ensured to not infringe the Cold Chain patents. This should give TTPS and KNL comfort knowing that their door is a high-quality product that is patent protected.

While our client is actively evaluating how best to act on protecting its valuable rights, it prefers and hopes that we may quickly come to an amicable agreement. Please respond no later than July 1, 2023 to indicate TTPS and KNL's willingness to resolve this matter along the foregoing lines. If I do not hear from you by that date, I will assume that you do not intend to cooperate and will advise my client accordingly.

We look forward to your anticipated cooperation in this matter. This letter is without prejudice to my client's rights, all of which are expressly reserved.

Please contact me if you have any questions.

With best regards,



Richard A. Sharpe

Very truly yours,



J. Gregory Chrisman

JGC/rpk

Enclosures

Exhibit A - U.S. Patent No. 9,151,084

Exhibit B – TTPS website ([Truck & Trailer Parts Solutions - ttpsusa.com](https://www.ttpsusa.com)) selling
“Patented” Single Panel Roll Door

cc: Ridge Corporation
Cold Chain, LLC

EXHIBIT 10



FAULKNER • GARMHAUSEN • KEISTER • SHENK

HARRY N. FAULKNER*
JOHN M. GARMHAUSEN
RALPH F. KEISTER
JAMES R. SHENK**

MICHAEL A. STAUDT
JAMES L. THIEMAN
THOMAS J. POTTS
DANIEL A. BENSMAN

BRYAN A. NIEMEYER
JOHN M. DEEDS
JOSHUA A. KOLTAK
PHILIP M. BORGER

CRAIG T. ALBERS***
CAMERON C. DOWNER
COLLEEN R. GONG
CHRISTOPHER J. ELLINGTON

* 1941 - 2021
** ALSO ADMITTED IN FLORIDA
*** CERTIFIED PUBLIC ACCOUNTANT

SENDER'S EMAIL: jgarmhausen@fgks-law.com

July 5, 2023

VIA EMAIL and U.S. MAIL

gchrisman@pearne.com

Mr. J. Gregory Chrisman

PEARNE GORDON

1801 East 9th Street, Suite 1200

Cleveland, OH 44114-3108

Re: Notice of U.S. Patent No. 9,151,084
Your Reference RIDGE.J9650

Dear Greg:

With apologies for the delay in acknowledging receipt of your letter of June 6, 2023 regarding the captioned matter, I have been corresponding with our IP counsel with respect to a review of the Cold Chain patent in order to enable me to respond to your letter.

Furthermore, among my client, counsel, and myself, we have overlapping vacations the next several weeks.

As such, I will respond as soon as I am able to do so.

Very truly yours,

A handwritten signature in black ink, appearing to be "John M. Garmhausen", written over a large, stylized, handwritten "J" that loops around the text.

John M. Garmhausen

cc: Jeff Philipot (via email)

X:\Files\Philipmar Designs LLC\Chrisman ltr 7.5.23.docx

EXHIBIT 11



FAULKNER • GARMHAUSEN • KEISTER • SHENK

HARRY N. FAULKNER*
JOHN M. GARMHAUSEN
RALPH F. KEISTER
JAMES R. SHENK**

MICHAEL A. STAUDT
JAMES L. THIEMAN
THOMAS J. POTTS
DANIEL A. BENSMAN

BRYAN A. NIEMEYER
JOHN M. DEEDS
JOSHUA A. KOLTAK
PHILIP M. BORGER

CRAIG T. ALBERS***
CAMERON C. DOWNER
COLLEEN R. GONG
CHRISTOPHER J. ELLINGTON

* 1941 - 2021
** ALSO ADMITTED IN FLORIDA
*** CERTIFIED PUBLIC ACCOUNTANT

SENDER'S EMAIL: jgarmhausen@fgks-law.com

August 1, 2023

VIA EMAIL

rsharpe@pearne.com

Mr. Richard A. Sharpe, Esq.

PEARNE GORDON

1801 East 9th Street, Suite 1200

Cleveland, OH 44114-3108

VIA EMAIL

gchrisman@pearne.com

Mr. J. Gregory Chrisman, Esq.

PEARNE GORDON

1801 East 9th Street, Suite 1200

Cleveland, OH 44114-3108

Dear Mr. Sharpe and Mr. Chrisman:

This letter responds to the infringement allegations of Ridge Corporation as to U.S. Patent No. 9,151,084 ("the '084 patent") set forth in your letter of June 6, 2023 and your email of July 6, 2023. For purposes of this letter, we assume that Ridge Corporation is an exclusive licensee of the '084 patent with all substantial rights.

The infringement allegations are unfounded and lack a good faith basis, for at least the following reasons. All of the claims of the '084 patent require "a foam insulating material" attached to a thermoplastic membrane. There is no such foam insulating material in the TTPS product. Your June 6 letter erroneously claims that the TTPS product has a "single panel roll door [that] has a first outermost surface formed by membrane having fibers and a sheet of foam attached to the membrane that forms a second outermost surface." The sentence conveniently leaves out the "insulating" limitation, and there is no foam insulating material comprising "a second outermost surface opposite the first opposite outermost surface." As you know, the absence of even one claim limitation defeats a claim of infringement.

In consideration of the above, TTPS is not interested in the "commercial solution" you proposed in your June 6, 2023 letter.

If you have any other questions or concerns, please let me know.

Very truly yours,

A handwritten signature in black ink, appearing to read "John M. Garmhausen".

John M. Garmhausen

cc: Andrew Barnes (via email)

Jeff Philipot (via email)

X:\Files\Phlipmar Designs LLC\Sharpe Chrisman ltr 8.1.23.docx

Sidney Office: Courtview Center, Suite 300 | 100 South Main Avenue | Sidney, Ohio 45365 | Tel: 937.492.1271 | Fax: 937.498.1306

Fort Loramie Office: 31 South Main Street | Fort Loramie, Ohio 45845 | Tel: 937.295.2983 | Fax: 937.295.3633

Troy Office: 74 Troy Town Drive | Troy, Ohio 45373 | Tel: 937.524.5969 | Fax: 937.498.1306

Celina Office: 104 South Main | Celina, Ohio 45822 | Tel: 419.258.8275 | Fax: 937.498.1306

www.fgks-law.com

Exhibit 11

EXHIBIT 12

PEARNE GORDON

PATENTS • TRADEMARKS • COPYRIGHTS • INTELLECTUAL PROPERTY LITIGATION

Richard A. Sharpe
rsharpe@pearne.com

J. Gregory Chrisman
gchrisman@pearne.com

June 9, 2023

Via Electronic Mail and Federal Express
Return Receipt Requested

Dominic Grandominico
Altum LLC
92 Elm Street, Suite B
Canal Winchester, Ohio 43110

Greg Karst
Altum LLC
92 Elm Street, Suite B
Canal Winchester, Ohio 43110

Kyle Gaines
Altum LLC
92 Elm Street, Suite B
Canal Winchester, Ohio 43110

Re: Notice of U.S. Patent No. 9,151,084

Dear Sirs,

This firm represents Ridge Corporation (“Ridge”) in connection with its respective intellectual property matters. This is to inform you that Altum LLC (“Altum”) is infringing U.S. Patent No. 9,151,084 to Cold Chain, LLC. Ridge is the exclusive licensee of U.S. Patent Nos. 9,151,084 and 10,066,434 to Cold Chain, LLC. Of note, the claims of the ‘084 patent cover single-panel, roll-up doors for use in trucks, trailers and buildings, along with methods for providing the single-panel, roll-up doors on tracks for moving the doors. A copy of the ‘084 patent is attached as Exhibit A.

It has come to our attention that Altum is offering for sale and selling a door and/or door panel specially designed to be used in a single panel roll-up door marketed by Kirk National Lease (“KNL”) and/or Truck & Trailer Parts Solutions Inc. (“TTPS”) in the United States. This door and/or door panel, which is pictured in the attached Exhibits B and C, infringes one or more claims of the ‘084 patent. Specifically, the single panel roll door is designed to flexibly roll open

and closed in tracks having a radius of curvature to cover a door opening, for instance, an opening in a truck or trailer. The door has wheels attached to allow the door to fit into the tracks for guiding the door during opening and closing. Further, the single panel roll door has a first outermost surface formed by membrane having fibers and a sheet of foam attached to the membrane that forms a second outermost surface. Accordingly, the KNL-TTPS single panel roll door infringes one or more claims of the '084 patent.

Under 35 U.S.C. §271(c) it is an act of infringement to sell or offer to sell a material component of the infringing KNL-TTPS door knowing the same to be especially made or especially adapted for use in the infringing door if the component is not a staple article suitable for substantial non-infringing use. As established by Exhibit C, the doors/door panels Altum is selling to KNL-TTPS are designed specifically for the infringing KNL-TTPS door and have no substantial non-infringing use. Thus, Altum is liable for contributory infringement of one or more claims of the '084 patent. Likewise, under 35 U.S.C. §271(b), whoever actively induces infringement of a patent shall be liable as an infringer. By virtue of its design, manufacture and sale of doors and/or door panels for use in the infringing KNL-TTPS door, Altum is actively inducing infringement of one or more claims of the '084 patent and is liable as an infringer.

In view of the foregoing, we demand that Altum immediately cease and desist from making, using, selling or offering for sale the aforementioned doors and/or door panels to KNL, TTPS and any other entity for use in an infringing single-panel roll-up door application. We request your response confirming that Altum will immediately cease all manufacture, use, sale or offer for sale of the above-identified doors and/or door panels by **July 1, 2023**. If we do not hear from you by that date, we will assume that you do not intend to cooperate and will advise our client accordingly.

This letter is without prejudice to my client's rights, all of which are expressly reserved.

Please contact me if you have any questions.

With best regards,



Richard A. Sharpe

Very truly yours,



J. Gregory Chrisman

Enclosures

Exhibit A - U.S. Patent No. 9,151,084

Exhibit B – TTPS website ([Truck & Trailer Parts Solutions - ttpsusa.com](https://www.truckandtrailerparts.com)) selling
“Patented” Single Panel Roll Door

Exhibit C – Altum Engineering Drawings

cc: Ridge Corporation
Cold Chain, LLC

EXHIBIT 13

ARNOLD & CLIFFORD LLP

E-mail address: mdillard@amlaw.com
Direct Dial: (614) 410-0031
Fax: (614) 469-1093

July 10, 2023

VIA EMAIL ONLY at
rsharpe@pearne.com
gchrisman@pearne.com

Richard A. Sharpe, Esq.
J. Gregory Chrisman, Esq.
Pearne Gordon
10 W. Broad Street, Suite 2100
Columbus, Ohio 43215

Re : Notice of U.S. Patent No. 9,151,084 (the “‘084 Patent”)

Messrs. Sharpe and Chrisman:

We have reviewed your June 9, 2023 letter to our client, Altum LLC (“Altum”), regarding the above-referenced matter. This letter responds to the contentions raised in your letter. Please direct any further correspondence on this issue directly to us.

As a preliminary matter, we note that you refer to an assignment of the ‘084 Patent to Ridge but did not provide a copy of the purported assignment. Please send us a fully executed copy of this assignment because otherwise Ridge has no ability to enforce Cold Chain’s patent.

In any event, even if we are to assume that Ridge holds a valid assignment of the ‘084 Patent, your contention that Altum is infringing the ‘084 Patent is patently and completely false. Indeed, we have had a detailed review and analysis of the ‘084 Patent conducted and compared it with the accused product, including a detailed analysis of the ‘084 Patent’s prosecution history. That analysis indisputably demonstrates the baselessness of your infringement claims.

Accordingly, we demand that you and your client immediately stop making further false accusations against Altum or any of its customers, suppliers, or manufacturers based on the allegations contained in your letter. Please note that if you or your client persists in these frivolous allegations against Altum, we will take all appropriate actions, including but not limited to, filing a Rule 11 motion, seeking our fees and costs under 35 U.S.C. § 285, and even amending Altum’s counterclaim in the existing litigation to add a claim for tortious interference should your claims disrupt Altum’s business relationships.

This letter is sent without prejudice to our client’s rights, all of which are expressly reserved herein.

Richard A. Sharpe, Esq.
J. Gregory Chrisman, Esq.
July 10, 2023
Page 2

Please contact us with any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read "M. Dillard Jr.", with a stylized, cursive script.

Michael L. Dillard Jr.

CC: Damion M. Clifford, Esq.
Gerhardt A. Gosnell II, Esq.

EXHIBIT 14



BARNES LAW

PO Box 915
Waynesville, OH
Email: andrewbarnesip@gmail.com
Phone: (513) 494-6616

NOTICE OF PENDING PATENT

September 6, 2023

To: Whiting Door Manufacturing Corp.
113 Cedar Street
Akron, NY 14001

John Garmhausen
Faulkner, Garmhausen, Keister & Shenk
100 S Main Ave, Ste 300
Sidney, Ohio 45365

Subject: Notice of Pending Patent Application – Pub. No. US 2022/0169099 A1

Dear Whiting Door Manufacturing Corporation;

I am writing to provide notice regarding a Patent Application that is currently pending and could be relevant to your operations or products. The spirit of this letter mirrors the essence of the "Pat. Pending" notation commonly seen on product labels, serving to make stakeholders aware of the Patent's current status.

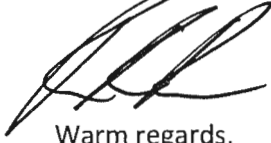
It is crucial to underscore that the Patent mentioned herein is at its application stage, with the status "pending." This distinction is made to ensure there is no misunderstanding or assertion that this letter might be misleading in any way.

In line with the above, I have included a copy of the published patent application with this letter for your reference. This step is in adherence to transparency and to provide a full context regarding the said application.

For legal clarification and pursuant to the rights and implications under U.S. legal provisions, particularly 28 USC sec. 154(d), notice is hereby provided to Whiting Door Manufacturing Corp. of Pub. No. US 2022/0169099 A1, a copy of which is enclosed. Potential entitlements to a reasonable royalty might arise for an infringer's utilization of the invention, starting from the date of the infringer's actual notice of the published patent application. This is subject to the eventual issuance of the patent and its claims aligning fundamentally with what has been disclosed in the publication.

I trust that this notice will be treated with the seriousness and consideration it warrants. If you have questions or require further clarification, please do not hesitate to contact me directly at 513-494-6616 or at andrewbarnesip@gmail.com

Thank you for your attention to this matter.

A handwritten signature in black ink, appearing to read 'AR Barnes', with a stylized flourish at the end.

Warm regards,
Andrew R Barnes, Esq.
USPTO Reg. # 76893

Enclosed:

US Patent Application US 2022/0169099A1

EXHIBIT 15

Electronic Patent Application Fee Transmittal				
Application Number:		17676144		
Filing Date:		19-Feb-2022		
Title of Invention:		Single Panel Roll-up Door		
First Named Inventor/Applicant Name:		Jeffery Phlipot		
Filer:		Andrew Barnes		
Attorney Docket Number:		020172022001		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	64	64
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	56	56
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				120

Electronic Acknowledgement Receipt

EFS ID:	48570518
Application Number:	17676144
International Application Number:	
Confirmation Number:	3447
Title of Invention:	Single Panel Roll-up Door
First Named Inventor/Applicant Name:	Jeffery Phlipot
Customer Number:	175298
Filer:	Andrew Barnes
Filer Authorized By:	
Attorney Docket Number:	020172022001
Receipt Date:	11-SEP-2023
Filing Date:	19-FEB-2022
Time Stamp:	23:46:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$120
RAM confirmation Number	E20239AN48149501
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Arguments/Remarks Made in an Amendment	Response_to_Office_Action.pdf	518423	no	45
			7707981e9ad404ad1fe7e29f1a3abe5345ddeb2b		

Warnings:**Information:**

2	Fee Worksheet (SB06)	fee-info.pdf	40682	no	2
			5c6c42d61eb157bd0cb50ef2d9763c6f2b9fb55c		

Warnings:**Information:**

Total Files Size (in bytes):			559105
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Appl. No.	:	17/676,144	Confirmation No. 3447
Applicant	:	Jeffery Philipot	
Filed	:	02-19-2022	
TC/A.U	:	3634	
Examiner	:	John Hanes	
Docket No.	:	020172022001	
Customer No.	:	175298	

Commissioner for Patents

P.O. Box 1450

Alexandria VA 22313-1450

AMENDMENT

Sir:

In response to the Office action of April 12, 2023, please amend the above-identified application as follows.

Amendments to the drawings

No amendments are needed, as claim five has been amended.

Amendment to the Abstract

Please the amendments to the abstract which is reflected on page 27.

Amendments to the Specification begin on page 2 of this document.

Amendment to the Claims are reflected in the listing of claims which begins on ____

Remarks/Arguments begin on page ____

BACKGROUND

[0001] Various aspects of the present disclosure relate generally to a roll-up door, specifically to a single panel roll-up door, and to a single panel roll-up door assembly.

[0002] Tractor trailers, large containers, refrigerated containers, and the like normally have either one multi-panel roll-up door to secure the opening of the enclosure of the trailer; or contain a set of hinged doors; or contain a combination of the two sets of two doors having outside hinged doors and internal multi-panel roll-up door. The multi-panel roll-up door is prevalent in semi-truck trailers, storage containers, refrigerated trailers, garages, and aircrafts. The multi-panel roll-up door consist of multiple panels of corrugated metal, aluminum, or wood panels wherein the multiple individual panels are coupled together, by hinges, joints, or the like, to allow for the door to be lifted into an open position and lowered into a closed position.

[0003] There are two main types of multi-panel roll-up doors, multi-panel roll-up doors that roll upon itself on a drum and multi-panel roll-up doors that are coupled to guide tracks and follow the guide tracks along the ceiling of the container. Multi-panel roll-up doors that are on a drum although present the ease of use, reduce the internal clearing height of a trailer or container. Multi-panel roll-up doors that roll-up on guide tracks and rest flat against the ceiling provide better clearance but are heavy and can present a hazard when lowering.

[0004] In considerations for a tractor trailer roll-up door, and various implementations of a multi-panel roll-up doors, the door must be able to withstand the elements and abuse from heavy use. The multi-panel door has the structural integrity to withstand the opening and closing, assaults from forklifts, and the durability to withstand bumpy roads. Multi-panel roll doors are heavy and even the best multi-panel door still has seams that are susceptible to water intrusion. Multi-panel

roll-up doors that have seals and joints to prevent water intrusion add to the overall weight of the roll-up door.

[0005] Therefore, a single panel roll-up door that is lighter than conventional roll-up doors, designed to withstand the elements, and eliminates water intrusion would be useful and advantageous.

BRIEF SUMMARY

[0006] According to aspects of the present disclosure, a single panel roll-up door; wherein the panel of the single panel door is a solid panel comprised of a multi-layer thermoplastic fibrous composite; wherein the panel of the single panel roll-up door has a front side, which is a continuous surface; a back side, comprising a first plateau; a first recessed channel, a second plateau, a second recessed channel, and a last plateau; a right roller bracket series; and a left roller bracket series. Wherein the single panel roll-up door becomes a single panel roll-up door assembly when coupled to a framed opening, the framed opening comprising a right side of the framed opening and a left side of the framed opening, of a container, the container comprising a floor and a ceiling; wherein the framed opening has a left guide track coupled to the left side of the framed opening that extend vertically from the floor to the ceiling bending to follow along the ceiling into the container; wherein the framed opening has a right guide track coupled to the right side of the framed opening that extend vertically from the floor to the ceiling bending to follow along the ceiling into the container; wherein the left roller bracket series of the panel are coupled to the left guide track of the framed opening; wherein the right roller bracket series of the panel are coupled to the right guide tracks of the framed opening; single-panel roll-up door comprising a single solid panel, roller brackets, and rollers; wherein the single panel roll-up door rollers are coupled to the left and right guide tracks of the framed opening of the container; and wherein the single panel roll-up door can be selectively raised to an open position and selective lowered into a closed position.

[0007] The panel, of the single panel roll-up door, comprising a top edge of the panel, a bottom edge of the panel, a left edge of the panel, a right edge of the panel, a front side of the panel, and a back side of the panel. Wherein, the back side of the panel having a surface comprising a first

plateau, a first recessed channel, a second plateau, a second recessed channel, and a last plateau.

Wherein the first plateau comprises a top edge, a bottom edge, and a flat surface spanning an area longitudinal, from the left edge of the panel to the right edge of the panel, and

perpendicular, from a top edge of the first plateau to the bottom edge of the first plateau, wherein the top edge of the first plateau meets with the top edge of the panel defining an edge therein.

The first recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the first recessed channel, wherein the top ridge of the first recessed channel meets the bottom edge of the first plateau defining an edge therein. The

second plateau comprising a top edge of the second plateau, a bottom edge of the second plateau, and a flat surface spanning an area longitudinal, from the left edge of the panel to the right edge

of the panel, and perpendicular, from the top edge of the second plateau, wherein the top edge of the second plateau meets with the bottom ridge of the first recessed channel, and the bottom

edge of the second plateau. The second recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the second recessed

channel, wherein the top ridge of the second recessed channel meets the bottom edge of the second plateau, a bottom ridge of the second recessed channel, and a channel of the second

recessed channel. The last plateau comprising a top edge of the last plateau, a bottom edge of the

last plateau, and a flat surface of the last plateau, spanning an area longitudinal from the left edge of the panel to the right edge of the panel, and perpendicular, from a top edge of the last

plateau, wherein the top edge of the last plateau meets the bottom ridge of the second recessed channel, to the bottom edge of the last plateau, wherein the bottom edge of the last plateau meets

the bottom edge the panel.

[0008] ~~The~~ A left roller bracket series of rollers, comprising a first left roller bracket; a first left roller; a second left roller bracket; a second left roller; a last left roller bracket; and a last left roller. rollers and roller brackets, are coupled to the left edge of the panel. Wherein the first left roller bracket is couple to the left edge of the panel to the first plateau of the backside of the panel. Wherein the first left roller is coupled to the first left roller. Wherein the second left roller bracket is coupled to the second plateau of the backside of the panel. Wherein the second left roller is coupled to the second left roller bracket. Wherein the last roller bracket is coupled to the last plateau of the backside of the panel. Wherein the last roller is coupled to the last roller bracket. Wherein in the single panel roll-up door is coupled to a framed opening to as in the single panel roll-up door assymbley; wherein the ~~The left roller bracket series of rollers are coupled to the left edge of the panel and are coupled to the left guide track. Wherein the left series of rollers coupled to the left edge of the panel and coupled to the left guide track in a manner that allows the rollers to freely roll along the left guide track. The left guide track is coupled to the left series of rollers and coupled to the left side of the framed opening of the container.~~

[0009] The right roller bracket series of rollers, comprising: a first right roller bracket; a first right roller; a second right roller bracket; a second right roller; a last roller bracket, and a last roller. Wherein the first right roller bracket is coupled to the right edge of the panel to the first plateau of the back side of the panel. Wherein the first right roller is coupled to the first right roller bracket in a manner that allows the first right roller to extend from the right edge of the panel, allowing the first right roller to freely roll as needed. Wherein the second right roller bracket is coupled to the right edge of the panel to the second plateau of the back side of the panel. Wherein the second right roller is coupled to the second right roller bracket in a manner

that allows the second right roller to extend from the right edge of the panel, allowing the second right roller to freely roll as needed. Wherein the last right roller bracket is coupled to the right edge of the panel to the last plateau of the back side of the panel. Wherein the last right roller is coupled to the last right roller bracket in a manner that allows the last right roller to extend from the right edge of the panel, allowing the last right roller to freely roll as needed. ~~rollers and roller brackets, coupled to the right edge of the panel.~~ The right roller bracket series of ~~rollers~~ coupled to the right edge of the panel are coupled to the right guide track. Wherein the right roller bracket series of ~~rollers~~ are coupled to the right edge of the panel and coupled to the right guide track in a manner that allows the rollers to freely roll along the right guide track. The right guide track being coupled to the right side of the framed opening of the container.

[0010] Wherein the left roller bracket series of rollers move in the left guide track and the right roller bracket series of rollers move in the right guide track, allowing the panel to be lifted in the opened position and lowered to the closed position. The left bracket series and right bracket series of rollers respectively traversing the left and right guide tracks. The course of the left and right guide tracks extending vertically from the floor of the container, the left guide track on the left side of the framed opening of the container and the right guide track on the right side of the framed opening of the container, to the ceiling of the container. When approaching the ceiling of the container, the guide tracks, bend at an arched angle back into the container following the course of direction of the ceiling into the container, allowing the panel, the left series of rollers and right series of rollers when in the opened position to rest in the guide tracks parallel in relation to the ceiling. Alternatively, when the panel is resting in the closed position the panel, the left series of rollers and the right series of rollers are perpendicular in relation to the ceiling and the floor of the container.

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BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF DRAWINGS

[0011] **FIG. 1** is a perspective view of a framed opening of a container, such as a container trailer for a semi-truck.

[0012] **FIG. 2** is perspective view of a framed opening of a container, such as a container trailer for a semi-truck, illustrating the left and right guide tracks, the right bracket roller series, rollers, and the panel resting in the opened state parallel to the ceiling of the container.

[0013] **FIG. 3** is a view from the front of the panel, illustrating the front side of the panel, the top and bottom edges the panel, and the left and right edges of the panel.

[0014] **FIG. 4** is a view from the back side of the panel, depicting the first plateau, showing the top edge of the first plateau correlating to the top edge of the panel, the first recessed channel, ~~the first recessed channel~~, the second plateau, the second recessed channel, the left and right roller bracket series of rollers, ~~the roller brackets~~, and the last plateau, having a bottom edge of the last plateau correlating to the bottom edge of the panel.

[0015] **FIG. 5** is a view from the rear of the container, as illustrated a container trailer, showing the panel resting in the closed position within the framed opening of the container, and the locking mechanism selectively locked to the floor of the container.

[0016] **FIG. 6** is a close up enlarge view of the back side of the panel illustrating the alternating series of second plateaus and second recessed channels, ~~the rollers~~, the right roller bracket series, ~~the edge stiffener~~, ~~wherein the rollers, roller brackets, and edge stiffener are coupled to~~ the alternating second plateau sections.

DETAILED DESCRIPTION

[0017] Aspects of the present disclosure provide for single panel roll-up door. Wherein the single panel roll-up door comprises a panel, left roller brackets series, and right roller bracket series. Wherein single panel roll-up door can be installed into framed opening of a container, wherein the framed opening of the container has left and right guide tracks for rollers. Wherein the roller brackets are coupled to the rollers, wherein a series of roller brackets and rollers define roller bracket series. Wherein the panel has a left roller bracket series and a right roller bracket series. Wherein the left roller bracket series are coupled to the left edge of the panel of the single panel roll-up door and right roller bracket series are coupled to the right edge of single panel roll-up door. Wherein the left and right roller bracket series of the single panel roll-up door are coupled respectively to the left and right guide tracks of the framed opening. Wherein the guide tracks of the framed opening ascend vertically toward the ceiling of the container, and upon approaching the ceiling of the container, the guide tracks bend back within the container and continue parallel to the ceiling of the container, within the container. Wherein the single panel roll-up door can be selectively in an opened position or closed position. When in the opened position the panel rest in the guide tracks in parallel to the ceiling of the container of the framed opening.

[0018] Aspects of the present disclosure provide for the single panel roll-up door, wherein the panel, of the single panel roll-up door, having a front side, a back side, a left edge, a right edge, a top edge and a back edge. Wherein the front side of the panel is a continuous smooth surface. Wherein the back side of the panel having a surface comprising a first plateau, a first recessed channel, a second plateau, a second recessed channel, and a last plateau recessed channel. Aspect of the present disclosure provide for single panel roll-up door that replaces conventional roll-up doors or the single panel roll-up door can be installed into new container builds.

[0019] Particularly, the single panel roll-up door as described herein can be configured to satisfy user-specified dimensions of the framed opening of a container. The user specific dimensions of the single panel roll-up door still allows the panel to be lighter than conventional roll up doors of the same dimensions. As well as the single panel roll-up door described herein, is a solid single panel, that is lighter than what is realized in conventional roll-up door technologies at comparable dimensions. In this regard, the single panel roll-up door describe herein is particularly well suited for applications for replacement of conventional roll-up doors and new installations of roll-up doors such as semi-trailer roll-up doors, container roll-up doors, storage container roll-up doors, refrigeration trailer roll-up doors, and the like.

[0020] Moreover, the single panel roll-up door described herein provides a single panel roll-up door with a front side, directed to the exterior of the container, comprising a continuous surface.

The single panel roll-up door described herein is a single solid panel comprised of a multi-layer thermoplastic composite, and is suited to prevent moisture intrusion form the elements. For instance, in the application of a semi-truck trailer, the single panel roll-up door, described herein, provides a seamless door preventing any moisture and mold. A conventional semi-trailer roll-up door is composed of multiple individual panels that are coupled together to form the roll-up door, even the best coupling for the multiple individual panels still has seams or joints. However, the single panel roll-up door, described herein, is a solid seamless single panel.

[0021] Moreover, to attain the desired rigidity of the multiple panel roll-up door necessary for a typical semi-trailer to withstand the elements; conventional roll-up doors requires material that is of either wood, metal, or other material, or the combination of the like which are heavy.

Comparatively, the single panel roll-up door described herein uses light-weight components but maintains the rigidity of industry standards of conventional roll-up doors with multiple panels.

[0022] Moreover, the single panel roll-up door described herein, having a rigid and durable integrity of a conventional roll-up door, still maintains a certain flexibility to withstand blunt force from the impact of a forklift. Conventional roll-up doors made of durable wood become damaged due to the lack of flexibility. The single panel roll-up described herein, has the flexibility to withstand blunt force. Thus, the single panel roll-up door described herein, would be suited for applications such as semi-trailers, and the single panel roll-up door described herein would be advantageous over conventional roll-up doors.

[0023] Moreover, the single panel roll-up door herein can be configured to satisfy user-specified dimensions and depths and still be able to traverse the angled bend of industry standard guide tracks for a conventional multiple-panel roll-up door. The single panel roll-up door described herein maintains its rigidity as well as can withstand the elements, and being lightweight can be configured to be thicker than conventional materials used in the industry. As an example advantage of the panel of the single panel roll-up door described herein, with increased thickness the panel of the single panel roll-up door can provide certain advantages of insulation more than conventional multi-panel roll up doors.

[0024] Moreover, previous challenges of creating such a single panel roll-up door that is suitable for semi-tractor trailers have failed due to limitations of materials. Previous attempts at creating such a single panel roll-up door have failed due to the inability to traverse the traditional guide tracks for roll up doors. Another reason previous attempts at a single panel roll-up doors have failed due to the inability to overcome the bending angle of the standard roll-up door guide tracks. Conventional materials lack the flexibility to be able to bend in order to be solid panel roll-up door. Conventional materials would need to be thin to achieve the flexibility the single panel roll-up door described herein has. Conventional materials needing to be thin would lose

the durability, and would easily be penetrable; losing the benefits of security that conventional material maintain. Such conceptual attempts using conventional materials would leave material to thin leading to warping at the bend, or be such a material that could not withstand the harsh conditions from the wind and elements during travel. Such a thin material would not hold up the continual and constant use, and further would not hold up to the rough environment of over the road hauling. However, the panel of the single panel roll-up door described herein overcomes these obstacles as it can be configured to satisfy user-specified dimensions of height, width, and depth and still have the flexibility to traverse the angled bend of industry standard guide tracks for a conventional multiple-panel roll-up door. The panel of the single panel roll-up door describe herein maintains its rigidity as well as can withstand the elements, and being lightweight can be configured to be thicker. The panel of the single panel roll up door described herein, is composed of a material that is lightweight, rigid, flexible, and provides a security that is improved over conventional materials.

[0025] Moreover, multi-panel roll-up doors that are used typically have hinges or joints between panels to accommodate the bend of guide tracks. Such reasons are why conventional roll-up doors are made of multi-panels, often coupled together by hinges or joints, to allow for the roll up door to have both structural integrity and flexibility to traverse the angled guide tracks. However, the single panel roll-up door described herein overcomes the need to use a multi-panel jointed or hinged panels by having the flexibility to traverse the industry standard guide tracks without the need for hinged or jointed coupling and does not have multiple panels.

[0026] Moreover, the single panel roll-up door described herein is more cost efficient than conventional multi-panel roll-up doors, and can be utilized to replace conventional multi-panel roll-up doors. One example embodiment of the single panel roll-up door described herein can

use the existing guide tracks of the existing multi-panel roll-up doors, and easily replace multi-panel roll-up doors.

[0027] Moreover, the single panel roll-up door described herein overcomes the limitations and shortcomings of the multi-panel roll-up door. In one aspect the single panel roll-up door maintains the ridged structure of the multi-panel roll up door without the need for multiple panels. In another aspect, the single panel roll-up door described herein achieves the flexibility of multi-panel roll-up door without having multiple panels that are coupled by hinges or joints.

[0028] Moreover, some over-the-road hauling trailers have converted to tarps instead of either multiple-panel-roll up doors or conventional two panel swinging doors. The benefit of tarps are that they are cheap and easy to replace, however they do not provide any security to the contents within the trailer. In contrast, the panel of the single panel roll-up door described herein has the cost benefits of tarps but maintains the rigid structure of multi-panel roll-up doors and improves security of the contents within the trailer. As the panel of the single panel roll-up door herein has the rigidity of a multiple-panel door but a higher flexibility rate, which would increase security of the contents of the trailer. Further, the panel of the single panel single roll-up door, described herein, is of a solid material that resist easy penetration comprising of material that maintains its structural integrity.

[0029] Referring now to the drawings, and in particular to FIG. 1 a perspective view of the framed opening of the container, such as a container trailer for a semi-truck. FIG. 1 depicts the framed opening 1 of the container in which the single panel roll-up would be coupled to.

Wherein the framed opening of the container comprising a left side 30, a right side 31, a top and a bottom. Wherein the container comprising a ceiling 2, a floor 3, a left wall of the container, and a right wall of the container.

[0030] Referring to FIG. 2, a perspective view of a framed opening of a container, such as a container trailer for a semi-truck, illustrating the left guide track 4 of the framed opening of the container, and a cut away view of the right guide track 5 framed opening of the container.

Wherein, the left 4 and right 5 guide tracks of the framed opening of the container being respectively coupled to the left 30 and right sides 31 of the framed opening; wherein the left guide track 4 of the framed opening is coupled to the left side of the framed opening 30 and right guide tracks coupled to the right side of the framed opening 31, ascend to the ceiling of the container 2 and arching back within in the container. Wherein the left 4 and right 5 guide tracks would also be coupled to the container ceiling 2 for the panel 6 to rest in the opened position in parallel in relation to the container ceiling 2.

[0031]Wherein, the left guide track 4 are coupled to a left roller bracket series of rollers 22 and the right guide tracks 5 are coupled to a right roller bracket series of rollers 23. Wherein, the left roller bracket series of rollers 22 are coupled to the left edge of the panel 7 and the right roller bracket series of rollers 23 are coupled to the right edge 9 of the panel 9. FIG 2 illustrating a cut away view of the right guide track 5, with a view of the right roller bracket series of rollers 23 within the right guide track 5 of the framed opening, the panel 6, and an indication of the rollers (the first roller 12 of the right series of rollers 23. FIG. 2 depicts the single panel roll-up door installed within the framed opening of a container as in the single panel roll-up door assembly. FIG. 2 depicts the panel 6, coupled to the left 22 and right 23 roller bracket series, wherein the left 22 and right 23 roller series are respectively coupled to the left 4 and right 5 guide tracks, wherein the left 4 and right 5 guide tracks are respectively coupled to the left 30 and right 31 sides of the framed opening. Wherein, the left 4 and right 5 guide tracks coupled respectively to the left 30 and right 31 sides of the framed opening ascend to the container ceiling and bend at an

arch to continue along the ceiling 2 parallel with ceiling of the container. Wherein the panel 6, when resting in an opened position, rest parallel with the ceiling of the container 2. The single panel roll-up door having a panel 6 that is coupled to the left roller bracket series of rollers 22, coupled to the left edge 9 of the panel, wherein the left roller bracket series of rollers 22 are coupled to the left guide track 4, wherein the left guide track 4 is coupled to the left side 30 of the framed opening of the container and the ceiling of the ~~container~~container. Wherein the right roller bracket series of rollers 23 are coupled to the right edge 7 of the panel; wherein, and the right roller bracket series of rollers 23 are coupled to the right guide track 5; wherein, and the right guide track 5 is coupled to the right side 31 of the framed opening and coupled to the ceiling of the container 2. Wherein, the left roller bracket series 22 of rollers and the right bracket series of rollers 23 are respectively coupled to the left 4 and right 5 guide tracks in a fashion that the coupling allows for the panel 6 of the single panel roll-up to be selectively raised and lowered.

[0032] FIG. 2 also illustrates another embodiment of the single panel roll-up door that could be installed as a replacement to a conventional multi-panel roll-up door within a container that has previously installed left 4 and right 5 guide tracks. Wherein the single panel roll-up door could be configured to be installed utilizing the existing guide tracks.

[0033] Referring to FIG. 3, a view from the front side 21 of the panel 6, illustrating the front side of the panel 21, the top edge of the panel 8, the bottom edge of the panel 10, the left edge of the panel 7, and the right edge of the panel 7. FIG. 3 illustrates the smooth continuous surface of the front side of the panel 21. Additional, FIG. 3 depicts that front of the panel 21, as a solid single panel.

[0034] FIG. 3 also illustrates another ~~the~~ embodiment of the single panel roll-up door wherein the panel 6 comprises ~~a thermoplastic composite. In another embodiment of the single panel roll-up door, the panel 6 comprises~~ a multi-layer thermoplastic fibrous composite. Thermoplastic composites and ~~M~~multi-layer thermoplastic fibrous composites are well known in the industry, however, the innovation in utilizing such a material as a ~~thermoplastic composite or a multi-layer thermoplastic fibrous composite as in~~ described in the single panel roll-up door herein are novel. In another embodiment of the single panel roll-up door certain aspects of the thermoplastic composite or multi-layer thermoplastic fibrous composite create the panel, wherein the panel could be comprised of fibrous material such as multi-layer fiber reinforced thermoplastic, fibrous material of glass, fibrous material of plastic, ~~fibrous material of resin~~, fibrous material of fiberglass, or a combination thereof.

[0035] Referring to FIG. 4, a view from the back side of the panel 6, comprising a surface of a first plateau 11, a first recessed channel 24, a second plateau 27, a second recessed channel 28, a last plateau 25, a left roller bracket series of rollers 22, and a right roller bracket series of rollers 23.

[0036] Wherein the first plateau 11, comprises a top edge of the first plateau; a bottom edge of the first plateau; and a flat surface of the first plateau, spanning an area perpendicular from the top edge of the panel 8 to the bottom edge of the first plateau, and longitudinal from the left edge 9 of the panel 6 to the right edge 7 of the panel 6. Wherein the top edge of the first plateau 11 meets to the top edge 8 of the panel 6 defining an edge between the top edge of the first plateau and the top edge of the panel 8 and the bottom edge of the first plateau 24.

[0037] Wherein the first recessed channel 24, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the first recessed channel and a

bottom ridge of the first recessed channel, and a recessed channel of the first recessed channel.

Wherein the top ridge of the first recessed channel 24 meets the bottom edge of the first plateau

11 defining an edge line between the top ridge of the first recessed channel and the bottom edge

of the first plateau 11 . Wherein the bottom ridge of the ~~the~~ first recessed channel meets the top

edged of the second plateau 27. Wherein a space is defined between the top ridge of the first

recessed channel and the bottom ridge of the recessed channel, wherein the space creates the

recessed channel of the first recessed channel, and defining the recessed channel ~~a corridor~~

~~which~~ of the first recessed channel. Wherein the recessed channel of the first recessed channel is

a grooved section, grooved into the back side of the panel with a depth not to exceed the

thickness of the panel, and therein the recessed ~~a~~ channel is defined between the top ridge of the

first recessed channel and the bottom ridge of the first recessed channel.;

[0038] Wherein the second plateau 27, a flat surface spanning an area perpendicular form the

bottom ridge of the first recessed channel and longitudinal from the left edge 9 of the panel 6 to

the right edge 7 of the panel 6. Wherein the second plateau comprises a top edge of the second

plateau and a bottom edge of the second plateau. Wherein the top edge of the second plateau 27

meets with the bottom ridge of the first recessed channel 24 and defines an edge between the

bottom ridge of the first recessed channel and the top edge of the second plateau.

[0039] Wherein the second recessed channel, spanning longitudinal from the left edge 9 of the

panel 6 to the right edge 7 of the panel 6, comprising a top ridge of the second recessed channel

and bottom ridge of the second recessed channel. Wherein the bottom edge of the second plateau

meets the top ridge the second recessed channel 28, and defines and edge with the bottom edge

of the second plateau and the top ridge of the second recessed channel. ~~Wherein the recessed~~

~~channel comprises; a top ridge of the recessed channel, wherein the top ridge of the recessed~~

~~channel meets with the bottom edge of the plateau, defining an edge between the top ridge of the recessed channel and the bottom edge of the plateau; a bottom ridge of the recessed channel; and a channel of the recessed channel; W~~ wherein, the a recessed channel of the recessed channel is a grooved section, grooved into the back side of the panel with a depth not exceed the thickness of the panel, and therein thea rescessed channel of the second recessed channel is defined between the top ridge of the second recessed channel and the bottom ridge of the second recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel

[0040] Wherein the last plateau comprising a flat surface, spanning an area perpendicular, from the bottom edge of the recessed channel and bottom edge of the panel, and longitudinal, from the left edge 7 of the panel to the right edge 9 of the panel, comprising; a top edge of the last plateau 8, correlating to the bottom ridge of the recessed channel, and defining an edge between the bottom ridge of the recessed channel and the top edge of the last plateau; and a bottom edge of the last plateau 10, meet the bottom edge of panel 10 and defines an edge with the bottom edge of the last plateau and the bottom edge of the panel.

[0041] Wherein the left roller bracket series of rollers 22, comprising rollers 12 (a left first roller, a left second roller, and a left last roller), coupled to the panel 6 on the left edge 9 of the panel. FIG. 4 depicts the left roller bracket series of rollers 22 coupled to the back of the panel 6. The left roller bracket series of rollers 22 that are coupled to the left edge 9 of the panel 6. The ~~left edge of the left roller bracket series of rollers~~ 22 coupled to the left edge 9 of the panel are also coupled to the left guide track 4 in a manner that allows the rollers 12 to freely roll along the left guide track 4. The left guide track 4 is coupled to the left side of the framed opening of the container.

[0042] Wherein the right roller bracket series of rollers 23 are coupled to the panel 6 on the right edge 7 of the panel . The right roller bracket series of rollers 23 are coupled to the right edge 7 of the panel 6. FIG. 4 depicts the right roller bracket series of rollers 23 coupled to the back of the panel. The right roller bracket series of rollers 23 are also coupled to the right guide track 5 in a manner that allows the rollers_ to freely roll along the right guide track 4. The right_ guide track 4 is coupled to the right side of the framed opening of the container.

[0043] FIG. 4 depicts an embodiment of the single panel roll-up door wherein the left roller bracket series of rollers-22 and the right roller bracket series of rollers-23 are coupled to the back side of the panel. The left roller bracket series of rollers 22 coupled to the left edge of the panel 9 on the back side of the panel, wherein a left first roller bracket is coupled to the first plateau, a second left roller bracket is coupled to the second plateau, and a last roller bracket is coupled to the last plateau. Wherein, and the right roller bracket series of rollers-23 are coupled to the right edge 7 of the panel 6 . Wherein the right roller bracket series comprises a right first bracket, a right first roller, a right second bracket, a right second roller, a right last bracket, and a last right roller. Wherein. The left roller bracket series of rollers-22 are coupled to the left guide track. The left guide track 4 is coupled to the left side of the framed opening of the container. The right roller bracket series of roller 23 are coupled to the right guide track, wherein the right_ guide track 5 is coupled to the right side of the framed opening of the container.

[0044] FIG. 4 depicts another embodiment of the single panel roll-up door comprising a series alternating alternating second plateaus and recessed second recessed channels 26. Wherein the series of alternating plateaus and recessed channels 26 comprising a first plateau 11, a first recess channel 13, a second plateau 27, a second recess channel 28, a second plateau, a second recess

channel and continuing in alternating series of second plateaus 27, second recess channels 28 until meeting the user-specific length including the last plateau.

[0045] Wherein a last recessed channel in the alternating series of second plateaus and second recess channels meets the last plateau of the panel 15.

[0047] Wherein the last plateau comprisesing ; a top edge of the last plateau, meeting the bottom ridge of the last recessed channel , and a bottom edge of the last plateau 15, correlating to the bottom edge of panel 10.

[0048] Wherein the top edge of the last plateau 15, would correlate with the bottom ridge of the last second recess channel in the alternating series of second plateaus 27 and second recess channels 28 being determined by the dimensional length being user-specified in which the panel 6, in the closed position, close the opening of the framed container.

[0049] FIG. 4 depicts another embodiment of the single panel roll-up door comprising rollers 12 that are coupled to the panel 6 by a roller bracket 14. Wherein the roller 12 and the roller bracket 14 coupled to the backside of the panel in location to the first plateaus 11, the plateaus 27, and last plateau. Wherein the individual roller brackets comprise a coupling individually and respectively with the top and bottom edges of the first plateau, or plateaus, or the last plateau in relation to where each individual roller bracket is mounted relation to the first plateau, or the second plateaus, or the last plateau . The roller bracket that is coupled to the first plateau, is coupled in such a manner that the roller bracket strengthens the top and bottom edges of the first plateau, or the top and bottom edges the second plateaus, or the top and bottom edges of last plateau.

[0051] Referring to FIG. 5, a view from the rear of the container, as depicting an embodiment of the single panel roll-up door assembly mounted within a container trailer, showing the panel 6 resting in the closed position within the framed opening 1 of the container.

[0052] FIG. 5 depicts an additional embodiment of the single panel roll-up door in comprising a locking mechanism 16. Wherein the locking mechanism 16 is coupled to the last plateau and allows the panel to be selectively locked to the floor of the container.

[0053] Referring to FIG. 6, is a close up enlarged view of the back side of the panel depicting an additional embodiment of the coupling of the rollers 12 to the panel 6. FIG. 6 illustrates the second plateaus 27 and second recessed channels 13, the second rollers 12, the second roller brackets 14, the recessed channels of the second recessed channel edge-stiffener 20, wherein the second rollers 12, second roller brackets 14, and edge-stiffener 20 are coupled to the alternating series of second plateaus 27. FIG. 6 illustrates the alternating series of second plateaus 27 and the alternating series of second recess channels 13, represent the alternating series of second plateaus and second recess channels 26 without the first plateau and the last plateau due to the close up view. Section

[0054] One embodiment of the single panel roll-up door is in which the panel 6 comprises a thermoplastic composite material. In another embodiment of the single panel roll-up door, the panel 6 comprises a multi-layer thermoplastic fibrous composite. In yet another embodiment of the single panel roll-up door is in which the panel 6 comprises light weight wood bi-product.

[0055] In an example implementation of the single panel roll-up door, the panel 6 has a length of one-hundred and eleven inches and a width of one-hundred inches. In another example implementation of the single panel roll-up door, the panel 6 has length as described by user

specific needs and a width as described by user specific needs. In yet another example implementation of the single panel roll-up door, the panel 6 has a length of seventy two inches and a width of forty eight inches.

[0056] In an example implementation of the single panel roll-up door, the panel 6 has a thickness of up to $\frac{5}{8}$ ths of an inch. In another example implementation single panel roll-up door, the panel 6 has a thickness that may exceed one inch. In yet another example implementation of the single panel roll-up door, the panel 6 has a thickness of one fourth ($\frac{1}{4}$) of an inch. In yet another example implementation of the single panel roll-up door, the panel 6 has a thickness that can be specified by the user specified needs.

[0057] In an example implementation of the single panel roll-up door, the first plateau 11, a flat surface spanning an area perpendicular, from the top edge of the panel 8 to a bottom edge of the first plateau, and longitudinal from the left edge 9 of the panel 6 to the right edge 7 of the panel 6, comprising a top edge of the first plateau and the bottom edge of the first plateau; wherein the top edge of the first plateau 11 meets to the top edge 8 of the panel 6 defining an edge between the top edge of the first plateau and the top edge of the panel 8 and the bottom edge of the first plateau 24. The bottom edge of the first plateau meets with and wherein the distance between the top edge of the first plateau and the bottom edge for the first plateau 24 is a distance up to thirteen inches. In another example implementation of the single panel roll-up door, the first plateau wherein the distance between the top edge of the first plateau and the bottom edge of the first plateau 24 may have a distance that is less than thirteen inches. In yet another example implementation of the single panel roll-up door, the first plateau may have a distance between the top edge of the first plateau and the bottom edge of the first plateau 24 more than thirteen inches, dependent on user specific needs.

[0058] In an example implementation of the single panel roll-up door, wherein the first recessed channel 24, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprising a top ridge of the first recessed channel and a bottom ridge of the first recessed channel; wherein the top ridge of the first recessed channel 24 meets the bottom edge of the first plateau 11 defining an edge line between the top ridge of the first recessed channel and the bottom edge of the first plateau 11; wherein a space is defined between the top ridge of the first recessed channel and the bottom ridge of the first recessed channel; wherein the space creates recessed channel~~the corridor~~ of the first recessed channel; wherein the space between the top ridge of the first recessed channel and the bottom ridge of the first recessed channel are up to one inch in distance. In another example implementation of the single panel roll-up door, wherein the space between the top ridge of the first recessed channel and the bottom ridge of the first recessed channel may exceed one inch. In yet another example implementation of the single panel roll-up door, wherein the space between the top ridge of the first recessed channel and the bottom ridge of the first recessed channel may be defined as to user specific needs.

[0059] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting for the disclosure. As used herein, the singular forms “a”, “an”, and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms “comprises” and/or “comprising,” when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0060] The corresponding structures, materials, acts and equivalents of all means or step plus function elements in the claims below are intended to include any structure, material, or act for

performing the function in combination with other claimed elements as specifically claimed. The description of the present disclosure has been presented for purposes of illustration and description, but is not intended to be exhaustive or limited to the disclosure in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the disclosure. Aspects of the disclosure were chosen and described in order to best explain the principles of the disclosure and the practical application, and to enable others of ordinary skill in the art to understand the disclosure for various embodiments with various modifications as are suited to the particular use contemplated.

ABSTRACT OF THE DISCLOSURE

A single panel roll-up door comprising a panel, a left roller brackets series, and a right roller bracket series, ~~rollers, a left roller series, a right roller series.~~ Wherein the panel has a front side of the panel and a ~~Further the back side of the panel;~~ back side of the panel; wherein the surface of the back side of the panel comprises a first plateau, a first recessed channel, a second plateau, a second recessed channel, and a last recessed channel. Wherein the single panel roll-up door is coupled to a framed opening of a container; ~~such as in a single panel roll-up door assembly.~~ Wherein the panel of the single panel roll-up door assembly and the panel of the single panel roll-up door can be selectively in an opened position or closed position. ~~When in the opened position the panel rest in the guide tracks in parallel.~~

CLAIMS

What is claimed is:

Claim 1. A single panel roll-up door comprising: a panel, a left roller brackets series, and a right roller bracket series and rollers, wherein the single panel roll-up door, wherein the single panel roll-up door is installed into a framed opening of a container;

wherein the panel of the single panel roll-up door comprises: is a solid panel of a multi-layer thermoplastic fibrous composite wherein the panel comprises:

~~A solid panel comprising a multi-layer thermoplastic fibrous composite wherein the panel comprises:~~

a top edge of the panel; and

a bottom edge of the panel; and

a front side of the panel; wherein the front side of the panel is a continuous surface; and

a back side of the panel;

wherein the backside of the panel having a surface comprising: a first plateau, a first recessed channel, a second plateau, a second recessed channel, and a last plateau;

wherein the first plateau comprises: a top edge of the first plateau, wherein the top edge of the first plateau meets with the top edge of the panel defining an edge therein; a bottom edge of the first plateau; and a flat surface of the first plateau; wherein the flat surface of the first plateau spanning an area perpendicular from the top edge of the panel to the bottom

edge of the first plateau, and spanning an area longitudinal from the left edge of the panel to the right edge of the panel;

~~wherein the top edge of the first plateau meets with the top edge of the panel defining an edge therein; and~~

wherein the first recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel,

comprises: a top ridge of the first recessed channel; a recessed channel of the first recessed channel; and a bottom ridge of the first recessed channel;

wherein the bottom edge of the first plateau meets with the top ridge of the first recessed channel, defining an edge therein with the bottom edge of the first

plateau and the top ridge of the first recessed channel;

wherein the recessed channel of the first recessed channel is a grooved section, grooved into the back side of the panel with a depth not to exceed the thickness of

the panel, and therein the recessed channel is defined between the top ridge of the first recessed channel and

the bottom ridge of the first recessed channel;

wherein the second plateau comprises: a top ridge of the second plateau, a bottom edge of the second plateau, and a flat surface of the second plateau;

wherein the top edge of the second plateau meets with the bottom ridge of the first recessed channel defining an edge therein;

wherein the flat surface of the second plateau spans an area perpendicular, from the top edge of the second plateau to the bottom edge of the second plateau, and longitudinal, from the left edge of the panel to the right edge of the panel; and

wherein the second recessed channel comprises: a top ridge of the second recessed channel, wherein the top ridge of the second recessed channel meets with the bottom edge of the second plateau, defining an edge therein ~~between the top ridge of the recessed channel and the bottom edge of the plateau~~; a bottom ridge of the second recessed channel; and a recessed channel of the second recessed channel; wherein, the recessed channel of the second recessed channel is a grooved section, grooved into the back side of the panel with a depth not to exceed the thickness of the panel, and therein the recessed channel of the second recessed channel is defined between the top ridge of the second recessed channel and the bottom ridge of the second recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel; and

wherein the last plateau comprises: a top edge of the last plateau, wherein the top edge of the last plateau meets with the bottom ridge of

the second recessed channel defining an edge therein; a bottom edge of the last plateau, wherein the bottom edge of the last plateau meets with the bottom edge of the panel and defines an edge therein; and the flat surface of the last plateau; wherein the flat surface of the last plateau spans an area perpendicular from the top ~~first~~ edge of the last plateau ~~to~~ and the bottom edge of the last plateau, and spanning an area longitudinal from the left edge of the panel to the right edge of the panel;

wherein the left roller brackets series comprises: a first left roller bracket; a first left roller; a second left roller bracket; a second left roller, a last left roller bracket, and a last left roller;

wherein the first left roller bracket is coupled to the left edge of the panel to the first plateau of the back side panel;

wherein the first left roller is coupled to the first left roller bracket in a manner that allows the first left roller to extend from the left edge of the panel, allowing the first left roller to freely roll as needed;

wherein the second left roller bracket is coupled to the left edge of the panel to the second plateau of the back side panel;

wherein the second left roller is coupled to the second left roller bracket in a manner that allows the second left roller to extend from the left edge of the panel, allowing the second left roller to freely roll as needed;

wherein the last left roller bracket is coupled to the left edge of the panel to the last plateau of the back side panel;

wherein the last left roller is coupled to the last left roller bracket in a manner that allows the last left roller to extend from the left edge of the panel, allowing the last left roller to freely roll as needed;

wherein the right roller bracket series comprises: a first right roller bracket; a first right roller; a second right roller bracket; a second right roller, a last right roller bracket, and a last right roller;

wherein the first right roller bracket is coupled to the right edge of the panel to the first plateau of the back side of the panel;

wherein the first right roller is coupled to the first right roller bracket in a manner that allows the first right roller to extend from the right edge of the panel, allowing the first right roller to freely roll as needed;

wherein the second right roller bracket is coupled to the right edge of the panel to the second plateau of the back side of the panel;

wherein the second right roller is coupled to the second right roller bracket in a manner that allows the second right roller to extend from the right edge of the panel, allowing the second right roller to freely roll as needed;

wherein the last right roller bracket is coupled to the right edge of the panel to the last plateau of the back side of the panel;

wherein the last right roller is coupled to the last right roller bracket in a manner that allows the last right roller to extend from the right edge of the panel, allowing the last right roller to freely roll as needed.

are coupled to the left edge of the panel, wherein rollers are coupled to the roller brackets that are coupled to the left edge of the panel; wherein the roller brackets and the rollers are coupled to the ledge edge of the panel define a left series of rollers; wherein the left series of rollers are coupled to the left guide track of the framed opening; and

wherein roller brackets are coupled to the right edge of the panel, wherein rollers are coupled to the roller brackets that are coupled to the right edge of the panel; wherein the roller brackets and the rollers coupled to the right edge of the panel define a right series of rollers; wherein the right series of rollers are coupled to the right guide track of the framed opening;

wherein the right series of rollers and the left series of rollers allow the single panel roll-up door to move along the guide tracks, wherein the single panel roll-up door can be selective opened and closed; wherein the single panel roll-up door when in the open position rest in the guide tracks in parallel to the ceiling of the container,

Claim 2. The A single panel roll-up door assembly comprising: a single panel roll-up door and a framed opening of a container;

wherein the single panel roll-up door comprises: A single panel roll-up door comprising: a panel, a left roller bracket series, and a right roller bracket series;

wherein the panel of the single panel roll-up door is a solid panel of a multi-layer thermoplastic fibrous composite wherein the panel comprises:

_____ a top edge of the panel;

_____ a bottom edge of the panel;

a front side of the panel, wherein the front side of the panel is a continuous surface; and

a back side of the panel;

wherein the backside of the panel having a surface comprising: a first plateau, a first recessed channel, a second plateau, a second recessed channel, and a last plateau;

wherein the first plateau comprises: a top edge of the first plateau, wherein the top edge of the first plateau meets with the top edge of the panel defining an edge therein; a bottom edge of the first plateau; and a flat surface of the first plateau, wherein the flat surface of the first plateau spans an area perpendicular from the top edge of the panel to the bottom edge of the first plateau and spans an area longitudinal from the left edge of the panel to the right edge of the panel;

wherein the first recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel, comprises: a top ridge of the first recessed channel; a recessed channel of the first recessed channel; and a bottom ridge of the first recessed channel;

wherein the bottom edge of the first plateau meets
with the top ridge of the first recessed channel, defining
an edge therein with the bottom edge of the first
plateau and the top ridge of the first recessed channel;
wherein the recessed channel of the first recessed
channel is a grooved section, grooved into the back side
of the panel with a depth not to exceed the thickness of
the panel, and therein the recessed channel is defined
between the top ridge of the first recessed channel and
the bottom ridge of the first recessed channel;

wherein the second plateau comprises: a top ridge of the
second plateau, a bottom edge of the second plateau, and a flat
surface of the second plateau;

wherein the top edge of the second plateau meets with
the bottom ridge of the first recessed channel defining
an edge therein;

wherein the flat surface of the second plateau spans an
area perpendicular, from the top edge of the second
plateau to the bottom edge of the second plateau, and
longitudinal, from the left edge of the panel to the right
edge of the panel; and

wherein the second recessed channel comprises: a top ridge of the second recessed channel, wherein the top ridge of the second recessed channel meets with the bottom edge of the second plateau, defining an edge therein ; a bottom ridge of the second recessed channel; and a recessed channel of the second recessed channel; wherein the recessed channel of the second recessed channel is a grooved section, grooved into the back side of the panel with a depth not to exceed the thickness of the panel, and therein the recessed channel of the second recessed channel is defined between the top ridge of the second recessed channel and the bottom ridge of the second recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel; and

wherein the last plateau comprises: a top edge of the last plateau, wherein the top edge of the last plateau meets with the bottom ridge of the second recessed channel defining an edge therein; a bottom edge of the last plateau, wherein the bottom edge of the last plateau meets with the bottom edge of the panel defining an edge therein; and the flat surface of the last plateau; wherein the flat surface of the last plateau spans an area perpendicular from the top edge of the last plateau to the bottom edge of the last plateau, and spanning an area longitudinal from the left edge of the panel to the right edge of the panel;

wherein the left roller bracket series comprises: a first left roller bracket; a first left roller; a second left roller bracket; a second left roller, a last left roller bracket, and a last left roller;

wherein the first left roller bracket is coupled to the left edge of the panel to the first plateau of the back side panel;

wherein the first left roller is coupled to the first left roller bracket in a manner that allows the first left roller to extend from the left edge of the panel, allowing the first left roller to freely roll as needed;

wherein the second left roller bracket is coupled to the left edge of the panel to the second plateau of the back side panel;

wherein the second left roller is coupled to the second left roller bracket in a manner that allows the second left roller to extend from the left edge of the panel, allowing the second left roller to freely roll as needed;

wherein the last left roller bracket is coupled to the left edge of the panel to the last plateau of the back side panel;

wherein the last left roller is coupled to the last left roller bracket in a manner that allows the last left roller to extend from the left edge of the panel, allowing the last left roller to freely roll as needed;

wherein the right roller bracket series comprises: a first right roller bracket; a first right roller; a second right roller bracket; a second right roller, a last right roller bracket, and a last right roller;

wherein the first right roller bracket is coupled to the right edge of the panel to the first plateau of the back side of the panel;

wherein the first right roller is coupled to the first right roller bracket in a manner that allows the first right roller to extend from the right edge of the panel, allowing the first right roller to freely roll as needed;

wherein the second right roller bracket is coupled to the right edge of the panel to the second plateau of the back side of the panel;

wherein the second right roller is coupled to the second right roller bracket in a manner that allows the second right roller to extend from the right edge of the panel, allowing the second right roller to freely roll as needed;

wherein the last right roller bracket is coupled to the right edge of the panel to the last plateau of the back side of the panel;

wherein the last right roller is coupled to the last right roller bracket in a manner that allows the last right roller to extend from the right edge of the panel, allowing the last right roller to freely roll as needed;

wherein the framed opening of a container comprises: a left side of the framed opening; a left roller guide track, a right roller guide track; a right side of the framed opening; top of the framed opening; a ceiling of the container, internally in relation to the framed opening; and a floor of the container, internally in relation to the framed opening;

wherein the left roller guide track, a left track for rollers that allow rollers to transverse the left guide track, is coupled to the left side of the framed opening; wherein the left guide track extends vertically from the bottom of the framed opening to the top of the framed opening, then curving to extend internally from the framed opening along in parallel with the ceiling of

the container; wherein the left roller guide track is additionally coupled to the ceiling of the container;

wherein the right roller guide track, a right track for rollers that allow rollers to transverse the right guide track, coupled to the right side of the framed opening; wherein the right guide track extends vertically from the bottom of the framed opening to the top of the framed opening, then curving to extend internally from the framed opening along in parallel with the ceiling of the of the container; wherein the right guide track is additionally coupled to the ceiling of the container;

wherein the left series of rollers of the single panel roll-up door are coupled to the left guide track, in a manner that allows the left series of rollers to travers the left guide track;

wherein the right series of rollers of the single panel roll-up door are coupled to the right guide track, in a manner that allows the right series of rollers to traverse the right guide track;

wherein the left series of rollers and the right series of rollers are respectively coupled in a manner that allows the rollers to freely roll along the right and the left guide tracks of the framed opening in manner that allows the single panel roll-up door to have a selective open position and selective closed position; wherein the selective open position the single panel roll-up door travers the guide tracks extending vertically from the floor of the container to the ceiling of the container, approaching the ceiling into the container, bend at an arched angle back into the container following the course of direction of the ceiling into the container, allowing the panel in the opened position to rest, within the container, in the guide tracks parallel in relation to the ceiling, and alternatively when in the panel is resting in the closed position to be perpendicular in relation to the ceiling and the floor of the container.

~~of claim 1, wherein the panel is comprised of a thermoplastic composite.~~

Claim 3. The single panel roll up door assembly of claim 2 wherein the panel is coupled to a locking mechanism, and the locking mechanism is coupled to the bottom edge of the panel adapted to be selectively coupled to the floor of the container to lock the roll-up door in the closed position.

Claim 4. The single plane roll-up door assembly of claim 2, ~~of claim 1 or 2,~~ wherein the panel dimensions, width of the panel, thickness of the panel, the length of the panel are specified by user specific dimensions of the framed opening of the container; wherein the back of the panel comprises a first plateau, a first recessed channel, a second plateau, a second recessed change, and alternating series of second plateaus and second recessed channels, depending on user specific length, and a last plateau;

wherein the alternating series of second plateaus and second recessed channel begin after the second recessed channel of claim 2, and continue until meeting the user specific length; wherein the use specific lengths is meet the last alternating second recess channel of the alternating series of second plateaus and second recessed changels meet with the last plateau in the same manner as the second plateau meets with the last plateau in claim 2;

wherein each second recess channels of the alternating series of second plateaus and second recessed channel has a second left roller bracket, second left roller, in the same manner as the second plateau of claim 2. has an and continue comprises: a top ridge of the second plateau, a bottom edge of the second plateau, and a flat surface of the second plateau;

wherein the top edge of the second plateau meets with the bottom ridge of the first recessed channel defining an edge therein;

wherein the flat surface of the second plateau spans an area perpendicular, from the top edge of the second plateau to the bottom edge of the second plateau, and longitudinal, from the left edge of the panel to the right edge of the panel; and

wherein the second recessed channel comprises: a top ridge of the second recessed channel, wherein the top ridge of the second recessed channel meets with the bottom edge of the second plateau, defining an edge therein ; a bottom ridge of the second recessed channel; and a recessed channel of the second recessed channel; wherein the recessed channel of the second recessed channel is a grooved section, grooved into the back side of the panel with a depth not to exceed the thickness of the panel, and therein the recessed channel of the second recessed channel is defined between the top ridge of the second recessed channel and the bottom ridge of the second recessed channel, spanning longitudinal from the left edge of the panel to the right edge of the panel;

wherein in each second plateau of the alternating series of second plateaus and second recessed channels are coupled to an additional left roller bracket, on the left side of the each second plateau in the alternating series; wherein the roller bracket of the alternating series of second plateaus and second recessed is coupled to a left roller of the of the alternating series of second plateaus and second recessed; wherein the the

Claim 4. Deleted. The single panel roll-up door of claim 1, 2, or 3 wherein the panel is coupled to a locking mechanism, and the locking mechanism is coupled to the bottom edge of the panel adapted to be selectively coupled to the floor of the container to lock the roll-up door in the closed position.

Claim 5. Deleted. The single panel roll-up door of claim 1, 2, or 3 wherein the top edge of the panel is reinforced by a strengthening strip, the bottom edge of the panel is reinforced by a second strengthening strip, the right edge of the panel is reinforced by a third strengthening strip, and the left edge of the panel is reinforced by a fourth strengthening strip. Deleted.

Claim 6. Deleted. The single panel roll-up door of claim 1, 2, or 3 wherein the left series of rollers, comprising rollers, and the right series of rollers, comprising rollers are coupled to the back side of the panel with roller brackets; wherein, the roller brackets are coupled respectively to the left and right edges of the panel coupled to the portions of the back side of the panel designated as first plateau, plateau, and last plateau; wherein, the roller brackets are coupled with the top and bottom edges of the first plateau, the top and bottom edges of plateau, and top and bottom edges of the last plateau in a manner that strengthens the top and bottom edges of the first plateau, the plateaus, and the last plateau. Deleted.

Claim 7. Deleted. The single panel roll-up door of claim 1, 2, or three wherein the left series of rollers, comprising rollers and roller brackets, and the right series of rollers, comprising rollers and roller brackets, wherein the left and right series of rollers are respectively couple to in a manner that allows the rollers to freely roll along the right the left and right guide tracks of the framed opening in manner that allows the single panel roll-up door to have a selective opened position and selective closed position; wherein the selective open position the single panel roll-up door travers the guide tracks extending vertically from the floor of the container, the left guide track on the left side of the framed

opening of the container, to the ceiling of the container, approaching the ceiling into the container, bend at an arched angle back into the container following the course of direction of the ceiling into the container, allowing the panel in the opened position to rest, within the container, in the guide tracks parallel in relation to the ceiling, and alternatively when in the panel is resting in the closed position to be perpendicular in relation to the ceiling and the floor of the container.

Court does not anticipate the claims.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) (claim to a system for setting a computer clock to an offset time to address the Year 2000 (Y2K) problem, applicable to records with year date data in "at least one of two-digit, three-digit, or four-digit" representations, was held anticipated by a system that offsets year dates in only two-digit formats). See also **MPEP § 2131.02**. "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). Note that, in some circumstances, it is permissible to use multiple references in a **35 U.S.C. 102** rejection. See **MPEP § 2131.01**.

In *Court*, the invention that was a flexible door panel that has a least two transverse reinforcement. In the present disclosure the invention does not have any transverse reinforcements. The panel of such a material that transverse reinforcement are not need. As such *Court* does not teach nor disclose the present embodiment.

Secondly, the present disclosure includes a single panel that does not have stiffener bars to the panel but rather grooved channels that are recessed into the thermoplastic composite. The annotated figure two from *Court* does not include channels that are groove into the panel, but rather stiffener bars that are affixed to the panel. As such the grooved recessed channels are not taught nor disclosed by *Court*. *Court* specifically states in their disclosure that the stiffener bars are affixed to the panel, not grooved into the panel. "A plurality of stiffener bars 208 are affixed transversely across the width of the flexible panel 112, either continuously or partially. The plurality of stiffener bars 208 can be fixed on the exterior or interior of the flexible panel 112 for reinforcement. In the vertical position shown, the stiffener bars 208 are horizontally arranged substantially parallel to each other. When mounted on the flexible panel 112, the stiffener bars 208 provide rigidity in a direction perpendicular to the plane of the panel 112 and support the rollers 106. An exemplary stiffener bar 208 is depicted in FIG. 3 having a deep channel section 302 with flange portions 304 adjacent the channel section 302. Other stiffener bar 208 shapes can be used with the door of this invention."

Here in the present invention, there are no stiffener bars, as the channels are grooved recessed channels that are grooved directly into the material.

Therefore *Court* does not anticipate nor disclose the present invention. A person skilled in the ordinary arts would not find that stiffener bars that are attached to the unitary panel disclose grooved recessed channels.

Court discloses a broad genus and not the species.

Court does not anticipate the current invention. First, the breadth of *Court* is so large that virtually any type of polymer and fibrous material that would be made in to a door could be anticipated. In the specification *Court I* states "the fiber include virtually any fibrous material." Quite literally, even something that has yet be invented, *Court* could conceivably disclose. The scope and breadth of *Court* is not narrowly tailored to their invention, and therefore does not disclose the multi-layer thermoplastic

composite. Court does not disclose the species but yet attempts to capture every species by disclosing the genus “ fibrous resin.”

However, it has been established by the USPTO that a multi-layer thermoplastic composite, is not a the same a generic resin. A thermoplastic composite, is a unique species that can not be captured from the genus.

Conclusion

Not only does *Court* not disclose ever aspect of claim the invention, the two inventions are only similar in the fact that they are both solid panels. However, this is where the similarities end. The present. invention is a solid panel that utilizes grooved recessed channels, where as *Court* affixed stiffeners .

Further, *Court* does not disclose the of having plateaus and recessed channels as part of the panel, only merely affixing to the panel. This is separate and is not disclosed by the *Court* patent.

Further, even though *Court* contemplates fibrous resins, an ordinary person skilled in the arts of thermoplastic would understand that fibrous resins is merely the broad genus and not the species.

Therefore, *Court* does not anticipate this invention.



Respectfull Submitted

/s/ Andrew R Barnes
Andrew R Barnes

EXHIBIT 16

PRIVILEGED AND CONFIDENTIAL
PREPARED IN ANTICIPATION OF LITIGATION

U.S. Patent No. 9,151,084

Claim Elements	Exemplary Kirk NationalLease ("KNL")/Truck & Trailer Parts Solutions Inc. ("TTPS") Device
<p>What is claimed is:</p> <p>1. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom,</p> <p>the insulating overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface,</p>	<p>The accused KNL overhead door, shown below in FIGS. 1-7, is formed from a sheet of foam insulating material attached to a thermoplastic membrane and is therefore an insulated overhead door. The door rolls open (FIG. 2) and closed (FIG. 1) in tracks. In the closed position, the overhead door covers a door opening having a top and a bottom.</p>  <p>FIG. 1 – Closed Door Position</p>  <p>FIG. 2 – Open Door Position</p>

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[claim 1, cont.]

Shown in FIGS. 1 and 2, and illustrated in FIG. 4, the KNL door has a **first outermost surface** arranged opposite a **second outermost surface**, the **first outermost surface** being the exterior surface shown in FIG. 1 and the **second outermost surface** being the exposed foam surface shown in FIGS. 2 and 3. More specifically, claim 1 (at Col. 6, ll. 32-41), expressly defines the **second outermost surface** as being formed by the **foam insulating material**. FIG. 3 below is a close-up of the exposed **foam** surface of the KNL door shown in FIG. 2. Thus, the accused KNL door includes a **second outermost surface** opposite the **first outermost surface** as claimed.



FIG. 3

FIG. 2

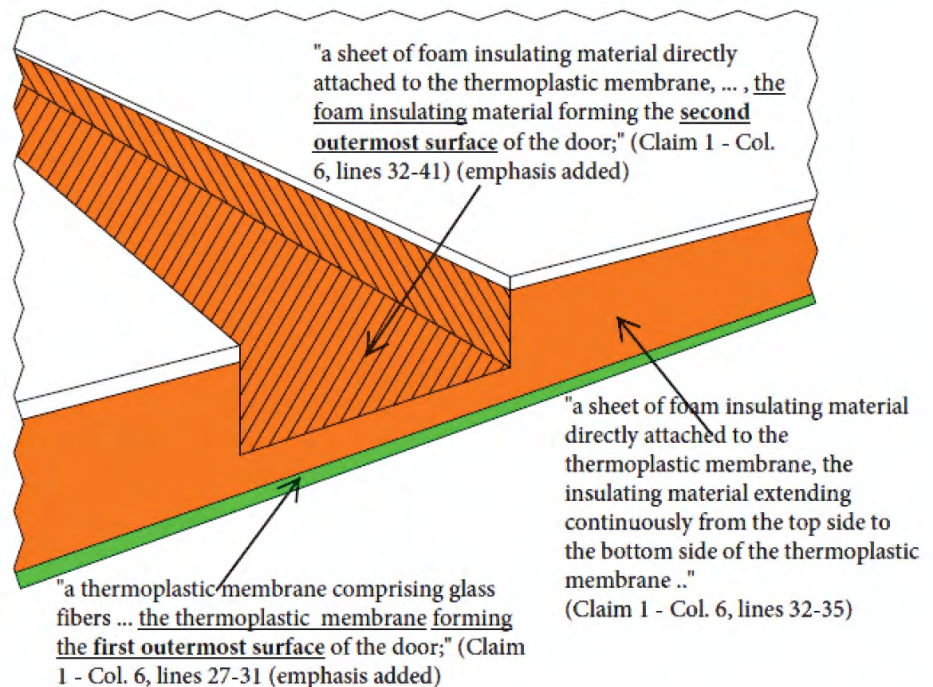


FIG. 4 (Illustration of FIG. 3)

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[claim 1, cont.]
both the **first outermost surface** and the **second outermost surface** being larger than any of the top surface, bottom surface, first side surface and second side surface,

The accused KNL door has a top surface, a bottom surface and first and second side surfaces corresponding to the outer perimeter edge surfaces of the door. The KNL overhead door has an estimated height (H) of 75 inches, a width (W) of 65 inches, and a thickness (T) of 0.5 inch as illustrated below.

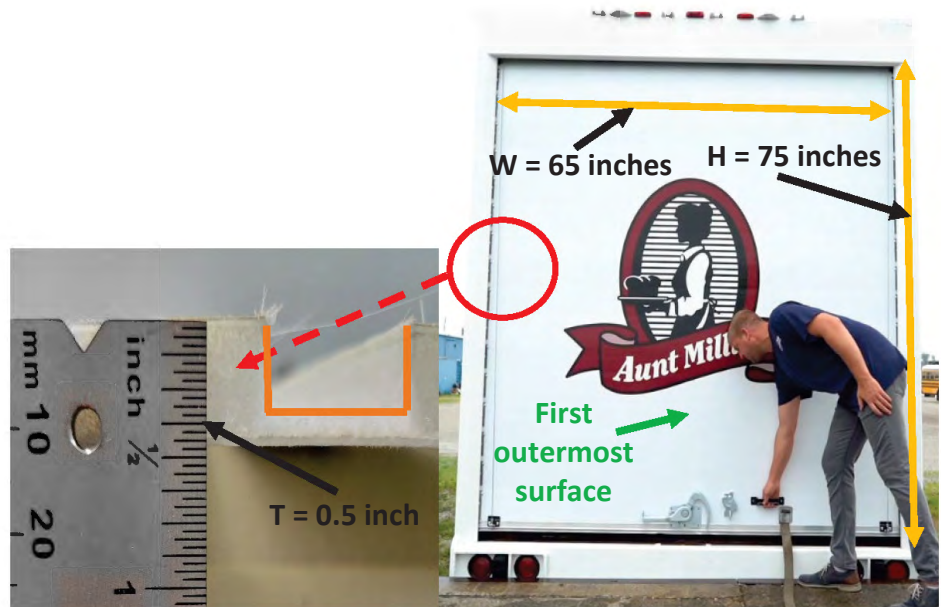


FIG. 1

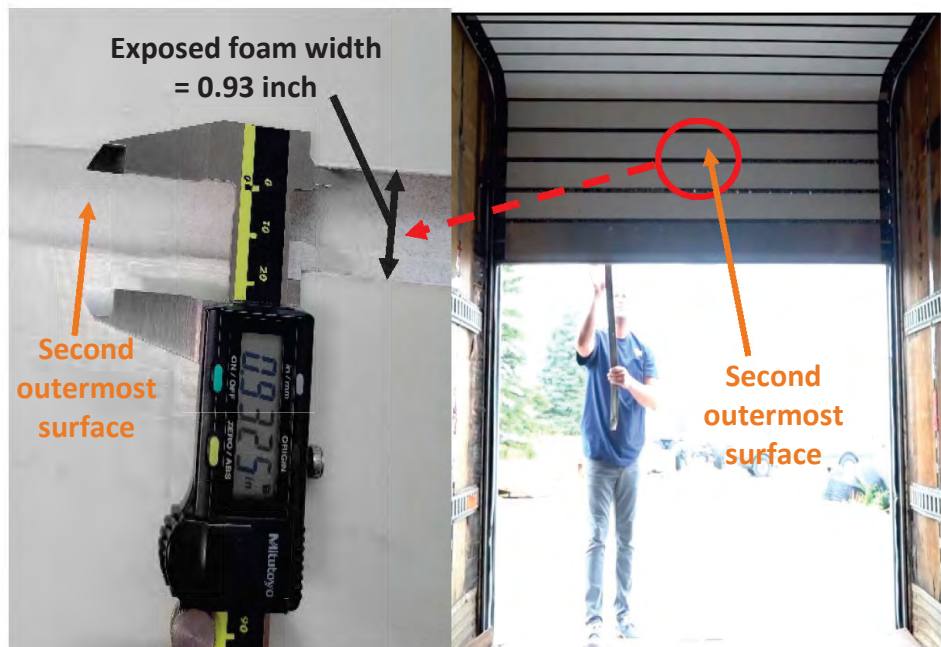


FIG. 2

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[claim 1, cont.]

Area Dimensions of KNL insulated overhead door:

- 1) Top (edge) surface = Width x Thickness = 65" x 0.5" = 32.5 square inches
- 2) Bottom (edge) surface = Width x Thickness = 65" x 0.5" = 32.5 square inches
- 3) First side (edge) surface = Height x Thickness = 75" x 0.5" = 37.5 square inches
- 4) Second side (edge) surface = Height x Thickness = 75" x 0.5" = 37.5 square inches
- 5) **First outermost surface** = Width x Height = 65" x 75" = 4,875 square inches, which is greater than any of 1), 2), 3) or 4)
- 6) Total **second outermost surface** = at least 10 second surfaces (cuts) x 60.45 square inches = 604.5 square inches, which is greater than any of 1), 2), 3) or 4)
 - a. Each **second outermost surface** is formed by a strip of exposed foam. The exposed foam width = 0.93"
 - b. Each **second outermost surface** = exposed foam width x door width = 0.93" x 65" = 60.45 square inches
 - c. Each **second outermost surface** is greater than any of 1), 2), 3) or 4)
 - d. Accused KNL door has at least 10 **second outermost surfaces** (i.e. exposed foam insulating material)

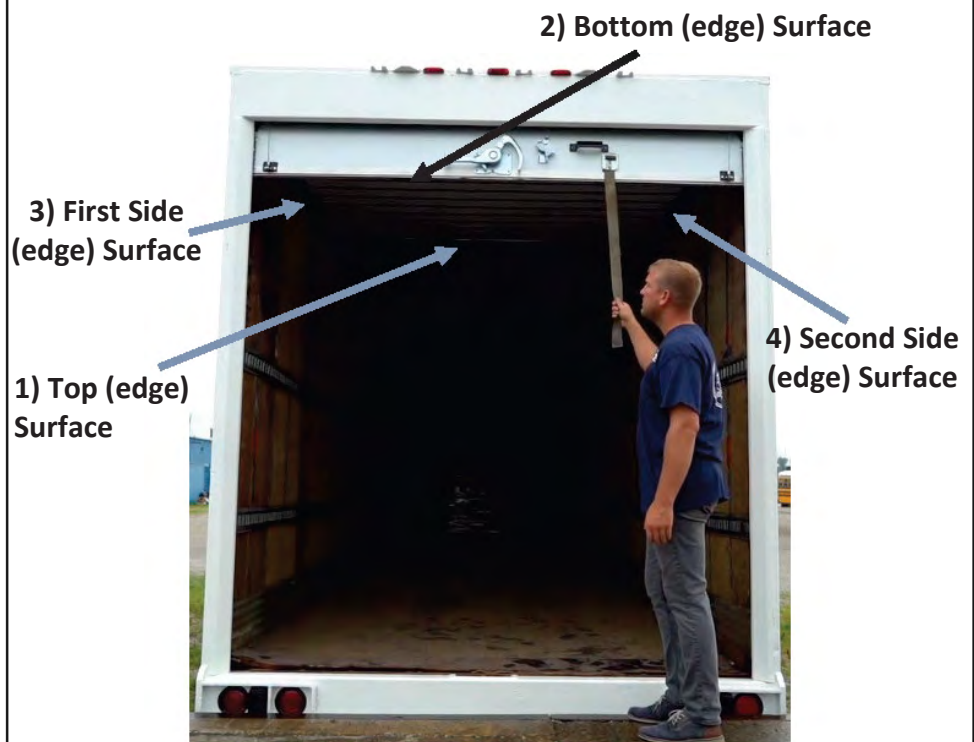


FIG. 7

[claim 1, cont.]
the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the thermoplastic membrane forming the first outermost surface of the door;

a sheet of foam insulating material directly attached to the thermoplastic membrane,

As established by the underlined claim language, the claimed thermoplastic membrane comprising glass fibers forms the **first outermost surface**. As seen above in FIGS. 1 and 2, the thermoplastic membrane forming the **first outermost surface** of the accused KNL door has a top side corresponding to the **top of the door opening** and a bottom side corresponding to the **bottom of the door opening** (See FIG. 1). The membrane forming the **first outermost surface** of the accused KNL door is a glass fiber reinforced membrane. Thus, the **first outermost surface** of the accused KNL door is a **thermoplastic membrane comprising glass fibers** as claimed.

As seen in FIG. 3, the accused KNL door has a continuous **sheet of foam insulating material** directly attached to **the thermoplastic membrane**.

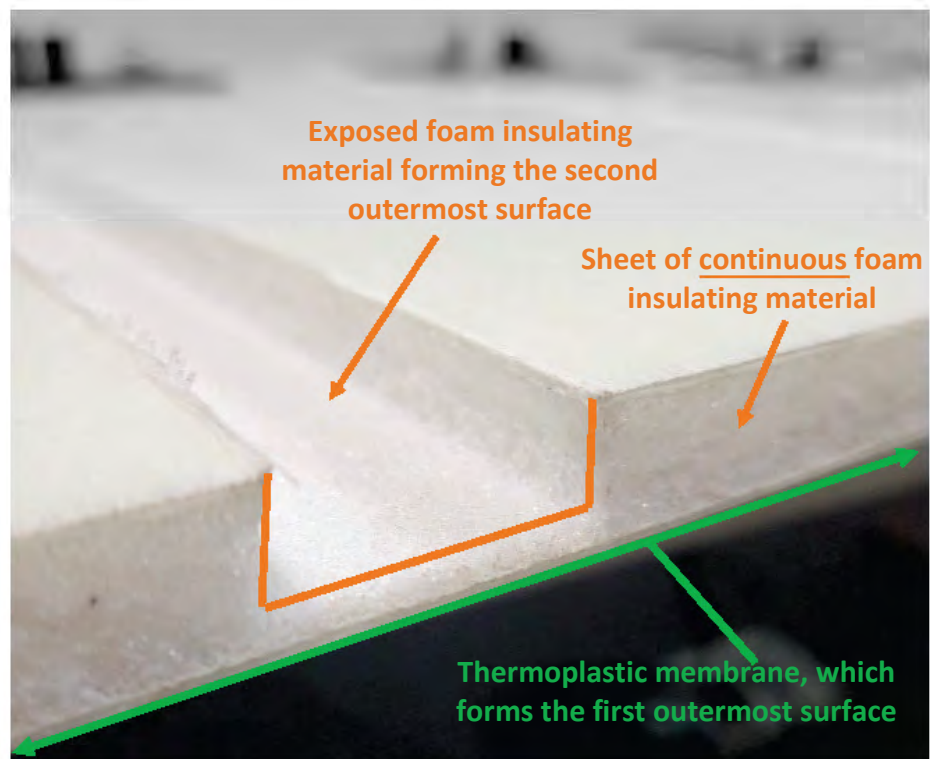


FIG. 3

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[claim 1, cont.]
the **insulating material** extending continuously from the top side to the bottom side of the **thermoplastic membrane**, the **thermoplastic membrane** and **insulating material** forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the **foam insulating material forming the second outermost surface** of the door; and

wheels attached to the door allowing the door to fit into **tracks** to guide the opening and closing of the door,

As seen in FIG. 3 and the illustration in FIG. 4, the **foam insulating material** is a continuous layer that has thick sections where the **foam insulating material** is covered by membrane layers and thin sections where the **foam insulating material** is exposed **forming the second outermost surface**. As shown above in FIGS. 2 and 3, the **foam insulating material** extends continuously from the top to the bottom of the **thermoplastic membrane**, thus forming a single panel that is approximately the size of the door opening to be covered, with the length of the single panel being the distance between the top side and the bottom side.

As seen in FIG. 2, and FIG. 5 below, the accused KNL door includes **wheels** attached to the door allowing the door to fit into **tracks** to guide the opening and closing of the door as demonstrated in FIG. 5.

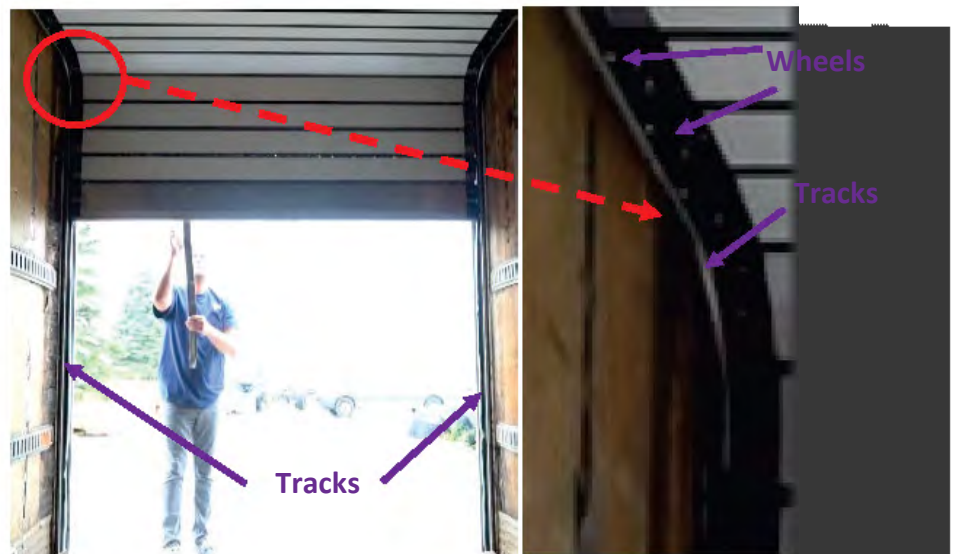


FIG. 5

PRIVILEGED AND CONFIDENTIAL
PREPARED IN ANTICIPATION OF LITIGATION

[claim 1, cont.]

wherein the overhead door comprises only one of the panel, the panel being flexible along the entire length of the panel so as to be capable of approximating the curvature of curved **tracks** having a radius of curvature ranging from about 5 inches to about 25 inches,

where the **track** has a **first length** positioned at an **angle, Θ** , relative to a **track** portion of a **second length**, wherein **Θ** ranges from about 80° to about 125°.

As seen throughout the above figures, the accused door comprises a single panel, which is defined in the claim as being formed by the **thermoplastic membrane (forming the first outermost surface)** and the **foam insulating material (forming the second outermost surface)**. As shown above in FIG. 5, because the accused KNL door the is able to open and close by traveling along the curved **tracks**, the KNL door is flexible along its entire length so as to be capable of approximating the curvature of the **tracks**, as claimed. The track radius of the accused KNL door is estimated to be about 10 inches.

As illustrated in FIG. 6 below, the **track** shown has a **first track length** positioned at an **angle Θ** relative to a **second track length**, wherein the **angle Θ** is estimated to be about 90° and within the claimed range of about 80° to about 125°.

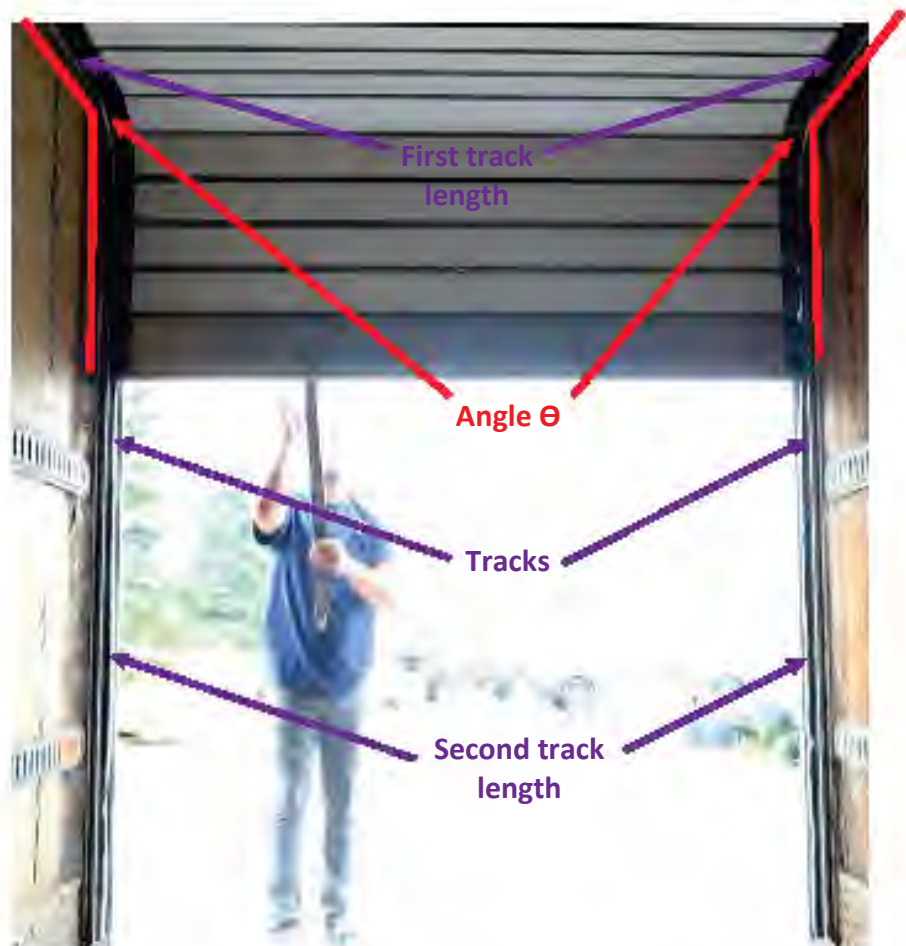


FIG. 6

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2. The insulated overhead door of claim 1, wherein the **thermoplastic membrane** is a single sheet.

The **thermoplastic membrane** of the accused KNL overhead door in FIG. 1 below forms the **first outermost surface**. As shown, the thermoplastic membrane of the accused KNL door is in the form of a single sheet as claimed.

Thermoplastic membrane (first outermost surface) in the form of a single sheet

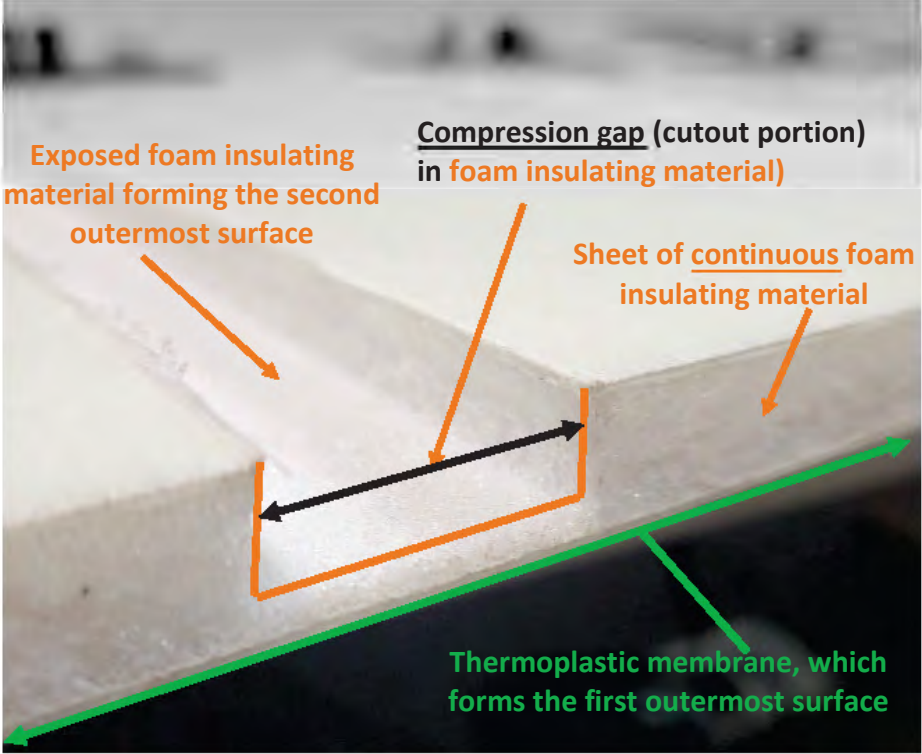


FIG. 1 – Closed Door Position

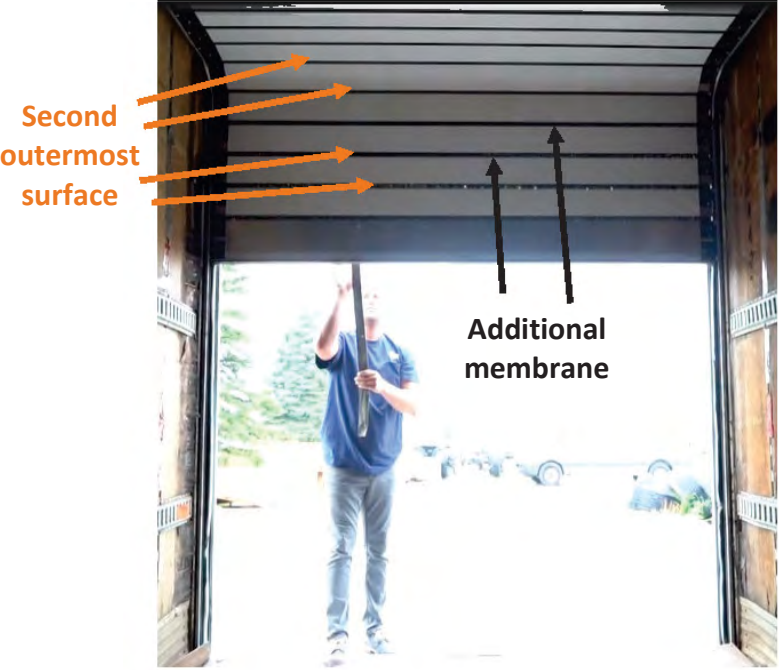
3. The insulated overhead door of claim 1, wherein the **thermoplastic membrane** comprises polypropylene impregnated with glass fibers.

The **thermoplastic membrane** of the accused KNL overhead door comprises polypropylene impregnated with glass fibers. Polypropylene is a thermoplastic material and, thus, the **first outermost surface** of the KNL insulated overhead door is a thermoplastic membrane comprising glass fibers as claimed.

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<p>4. The insulated overhead door of claim 1, wherein the insulating foam comprises <u>compression gaps</u> configured to allow the foam to more easily bend during opening and closing of the door.</p>	<p>As seen in FIG. 3, the continuous sheet of foam insulating material of the accused KNL door has a gap in its overall thickness where a portion of the foam has been removed to allow the foam to more easily bend. As seen in FIGS. 2 and 5, the accused door comprises a plurality of these <u>compression gaps</u> configured to allow the foam insulating material to more easily bend around the curved tracks during opening and closing of the door as shown in FIG. 2 and 5.</p>  <p style="text-align: center;">FIG. 3</p>
<p>5. The insulated overhead door of claim 1, wherein the insulating material is closed cell foam.</p>	<p>As seen in FIG. 3, the sheet of foam insulating material is a cellular foam.</p>
<p>6. The insulated overhead door of claim 5, wherein the closed cell foam comprises ethylene vinyl acetate.</p>	<p>As seen in FIG. 3, the sheet of foam insulating material is cellular and made from a polymeric material.</p>
<p>7. The insulated overhead door of claim 5, wherein the closed cell foam is chosen from polyethylene foams, polypropylene foams or neoprene based foams.</p>	<p>As seen in FIG. 3, the sheet of foam insulating material is cellular and made from a polymeric material.</p>

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<p>8. The insulated overhead door of claim 1, wherein the insulating material is an open cell foam.</p>	<p>As see in FIG. 3, the sheet of foam insulating material is a cellular foam.</p>
<p>9. The insulated overhead door of claim 1, further comprising an additional membrane that is not the thermoplastic membrane.</p>	<p>The accused KNL overhead door has an additional membrane attached to the sheet of foam insulating material. As shown in FIG. 2 below, in areas where the foam insulating material is not exposed (i.e. the second outermost surface), the KNL door has an additional membrane that is not the thermoplastic membrane that forms the first outermost surface.</p>  <p>Second outermost surface</p> <p>Additional membrane</p> <p><u>FIG. 2 – Open Door Position</u></p>

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11. A method comprising:
providing the insulated overhead door of claim 1 on **tracks**, at least a portion of the **tracks** being curved; and
moving the insulated overhead door so that a portion of the **thermoplastic membrane** and a portion of the **insulating material** flex to allow the door to traverse the curved portion of the **tracks**.

The accused KNL insulated overhead door operates on **tracks** having a curved portion such that a portion of the **thermoplastic membrane (first outermost surface)** and a portion of the **foam insulating material (second outermost surface)** flex to allow the door to traverse the curved portion of the **tracks**. This operation of KNL door is shown in FIGS. 1, 2.

Thermoplastic
membrane
(first
outermost
surface)



FIG. 1 – Closed Door Position

Second
outermost
surface



FIG. 2 – Open Door Position

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12. An overhead door assembly comprising:

a set of curved **tracks**; and

an insulated overhead door configured to roll open and closed in the tracks to cover a **door opening having a top and a bottom**,

The accused KNL overhead door, shown below in FIGS. 1-7, is formed from a sheet of foam insulating material attached to a **thermoplastic membrane** and is therefore insulated. The overhead door rolls open (FIG. 2) and closed (FIG. 1) in **tracks**. In the closed position, the accused door covers a **door opening having a top and a bottom**.



FIG. 1 – Closed Door Position

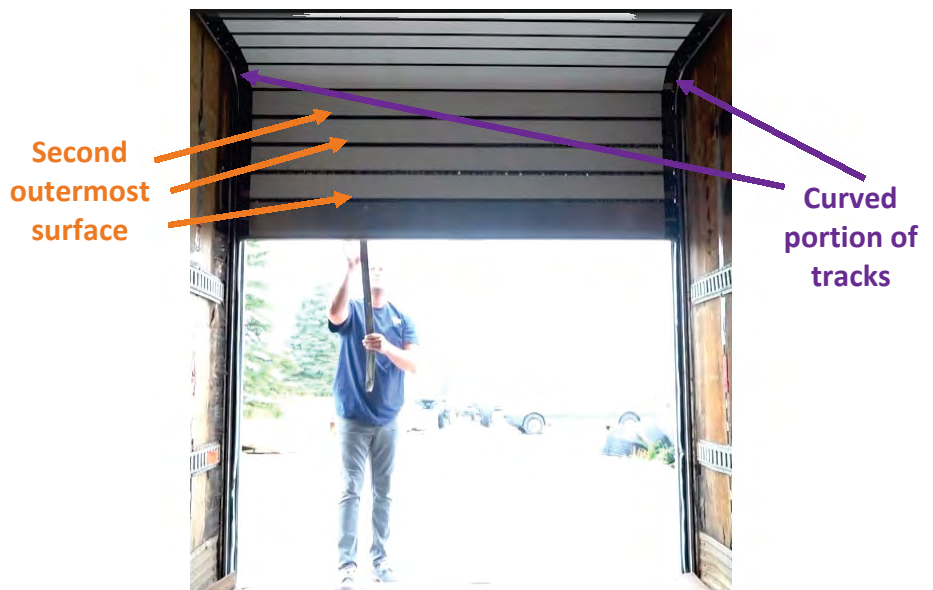


FIG. 2 – Open Door Position

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[claim 12, cont.]

the overhead door having a **first outermost surface**, a **second outermost surface** opposite the **first outermost surface**,

Shown in FIGS. 1 and 2, the KNL door has a **first outermost surface** arranged opposite a **second outermost surface**, the **first outermost surface** being the exterior surface shown in FIG. 1 and the **second outermost surface** being the exposed **foam** surface shown in FIGS. 2 and 3. More specifically, claim 12 (at Col. 7, ll. 40-42), expressly defines the **second outermost surface** as being formed by the **foam insulating material**. FIG. 3 below is a close-up of the exposed **foam** surface shown in FIG. 2. Thus, the accused KNL door includes a **second outermost surface** opposite the **first outermost surface** as claimed.

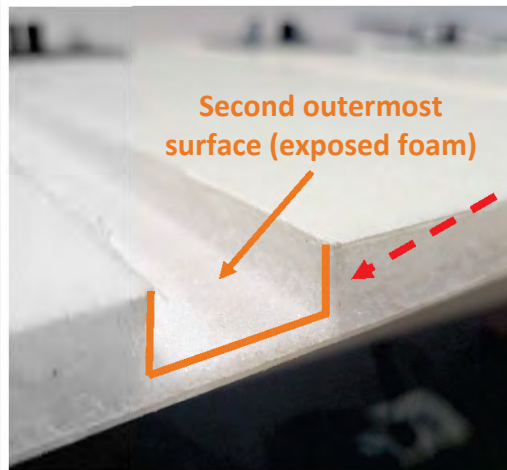


FIG. 3



FIG. 2

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[claim 12, cont.]

a top surface, a bottom surface, a first side surface and a second side surface, both the **first outermost surface** and the **second outermost surface** being larger than any of the top surface, bottom surface, first side surface and second side surface,

The accused KNL door has a top surface, a bottom surface and first and second side surfaces corresponding to the outer perimeter edge surfaces of the door. The KNL overhead door has an estimated height (H) of 75 inches, a width (W) of 65 inches, and a thickness (T) of 0.5 inch as illustrated below.

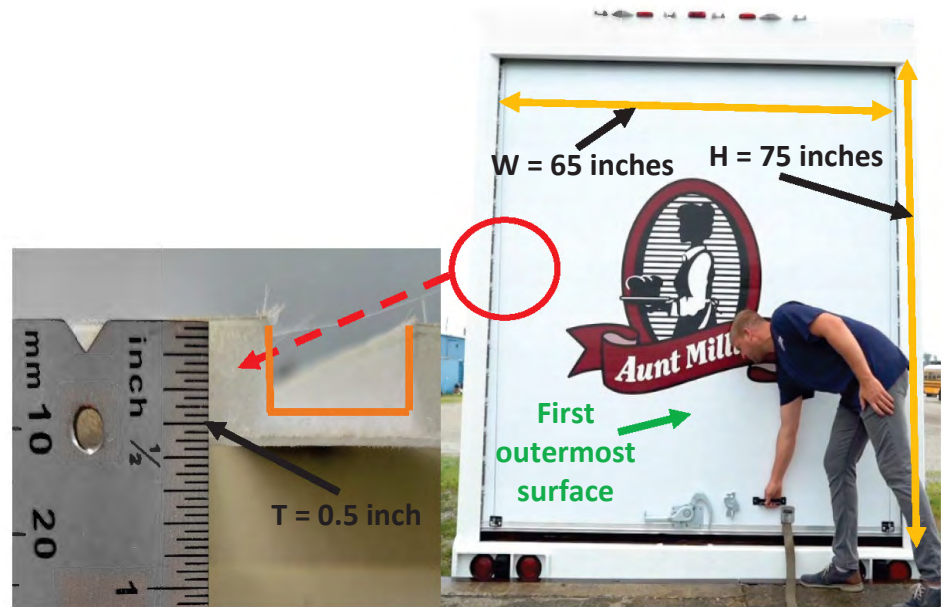


FIG. 1

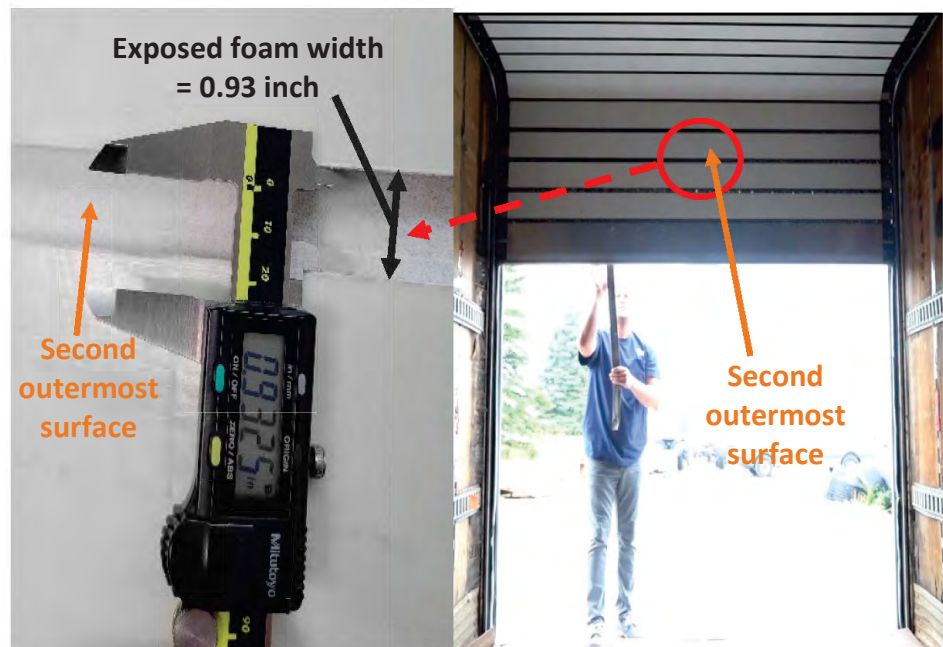


FIG. 2

PRIVILEGED AND CONFIDENTIAL
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[claim 12, cont.]

Area Dimensions of KNL insulated overhead door:

- 7) Top (edge) surface = Width x Thickness = 65" x 0.5" = 32.5 square inches
- 8) Bottom (edge) surface = Width x Thickness = 65" x 0.5" = 32.5 square inches
- 9) First side (edge) surface = Height x Thickness = 75" x 0.5" = 37.5 square inches
- 10) Second side (edge) surface = Height x Thickness = 75" x 0.5" = 37.5 square inches
- 11) **First outermost surface** = Width x Height = 65" x 75" = 4,875 square inches, which is greater than any of 1), 2), 3) or 4)
- 12) Total **second outermost surface** = at least 10 second surfaces (cuts) x 60.45 square inches = 604.5 square inches, which is greater than any of 1), 2), 3) or 4)
 - e. Each **second outermost surface** is formed by a strip of exposed foam. The exposed foam width = 0.93"
 - f. Each **second outermost surface** = exposed foam width x door width = 0.93" x 65" = 60.45 square inches
 - g. Each **second outermost surface** is greater than any of 1), 2), 3) or 4)
 - h. Accused KNL door has at least 10 **second outermost surfaces** (i.e. exposed foam insulating material)

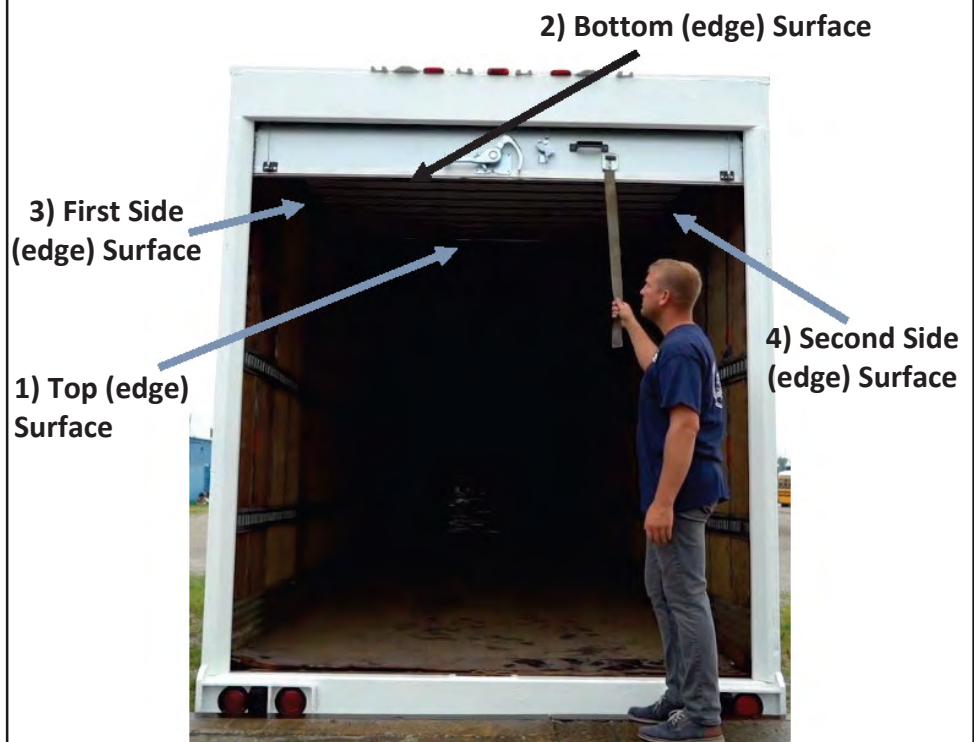


FIG. 7

PRIVILEGED AND CONFIDENTIAL
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[claim 12, cont.]
the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening when the door is in a closed position, the thermoplastic membrane forming the first outermost surface of the door;

a sheet of foam insulating material directly attached to the thermoplastic membrane,

As established by the underlined claim language, the claimed thermoplastic membrane comprising glass fibers forms the **first outermost surface**. As seen above in FIGS. 1 and 2, the thermoplastic membrane forming the **first outermost surface** of the accused KNL door has a top side corresponding to the **top of the door opening** and a bottom side corresponding to the **bottom of the door opening** (See FIG. 1). The membrane forming the **first outermost surface** of the accused KNL door is a glass fiber reinforced membrane. Thus, the **first outermost surface** of the accused KNL door is a **thermoplastic membrane comprising glass fibers** as claimed.

As seen in FIG. 3, the accused KNL door has a continuous **sheet of foam insulating material** directly attached to **the thermoplastic membrane**.

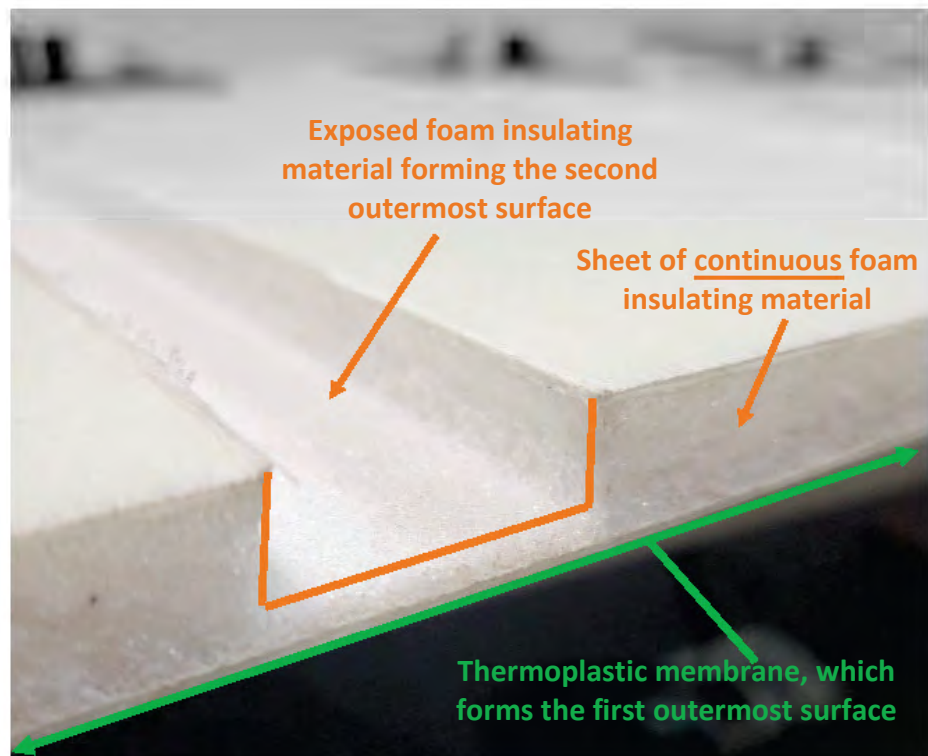


FIG. 3

PRIVILEGED AND CONFIDENTIAL
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[claim 12, cont.]

the **insulating material** extending continuously from the top side to the bottom side of the **thermoplastic membrane**, the **thermoplastic membrane** and **insulating material** forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the **foam insulating material** forming the **second outermost surface** of the door; and

wheels attached to the door allowing the door to fit into **tracks** to guide the opening and closing of the door,

As seen in FIG. 3, the **foam insulating material** is a continuous layer that has thick sections where the **foam insulating material** is covered by membrane layers and thin sections where the **foam insulating material** is exposed, forming the **second outermost surface**. As shown above in FIGS. 2 and 3, the **foam insulating material** extends continuously from the top to the bottom of the **thermoplastic membrane**, thus forming a single panel that is approximately the size of the door opening to be covered, with the length of the single panel being the distance between the top side and the bottom side.

As seen in FIG. 2, and FIG. 5 below, the accused KNL door includes **wheels** attached to the door allowing the door to fit into **tracks** to guide the opening and closing of the door as demonstrated in FIG. 5.

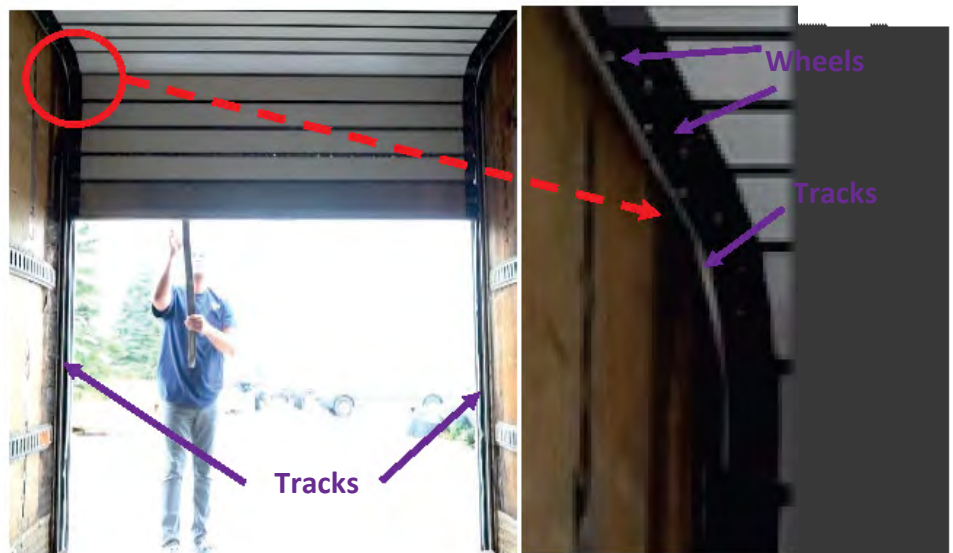


FIG. 5

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[claim 12, cont.]

wherein the overhead door comprises only one of the panel, the panel being flexible along the entire length of the panel so as to be capable of approximating the curvature of curved **tracks** having a radius of curvature ranging from about 5 inches to about 25 inches,

where the **track** has a **first length** positioned at an **angle, Θ** , relative to a **track** portion of a **second length**, wherein **Θ** ranges from about 80° to about 125°.

As seen throughout the above figures, the accused door comprises a single panel, which is defined in the claim as being formed by the **thermoplastic membrane (forming the first outermost surface)** and the **foam insulating material (forming the second outermost surface)**. As shown above in FIG. 5, because the accused KNL door is able to open and close by traveling along the curved **tracks**, the door is flexible along its entire length so as to be capable of approximating the curvature of the **tracks**, as claimed. The track radius of the accused KNL door is estimated to be about 10 inches.

As illustrated in FIG. 6 below, the **track** shown has a **first track length** positioned at an **angle Θ** relative to a **second track length**, wherein the **angle Θ** is estimated to be about 90° and within the claimed range of about 80° to about 125°.

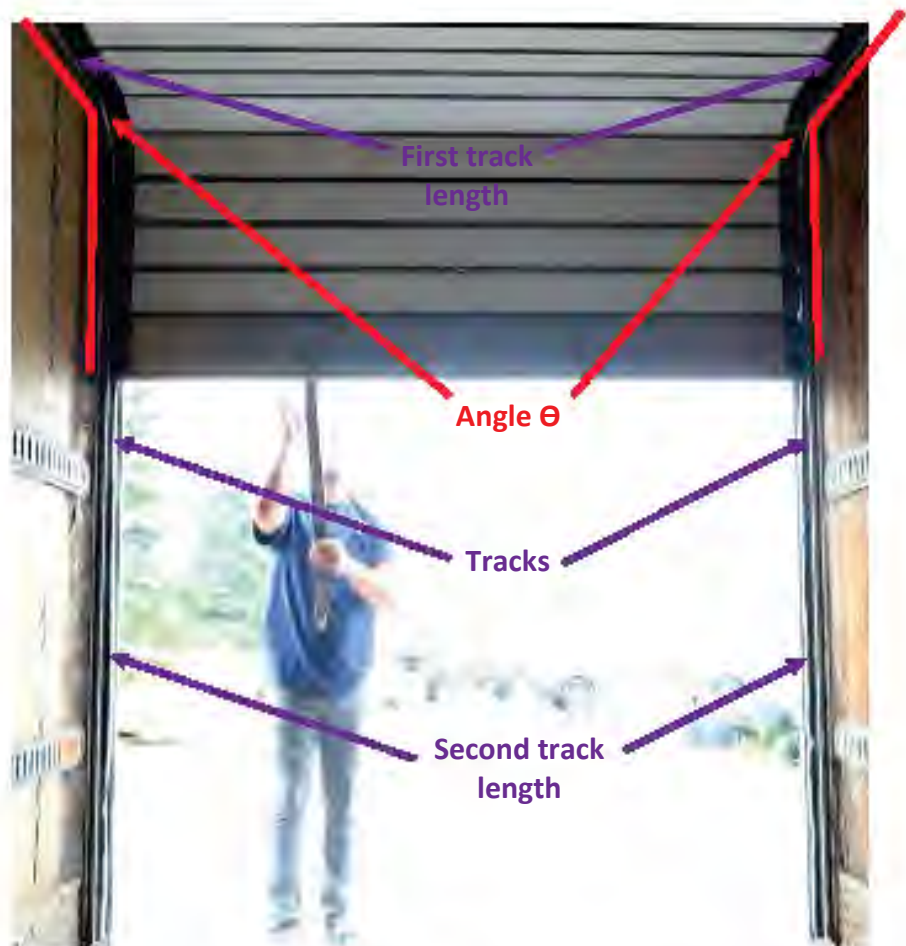


FIG. 6

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13. A truck comprising the insulated overhead door assembly of claim 12.

The accused KNL overhead door, shown below in FIGS. 1-2, is installed in a truck.

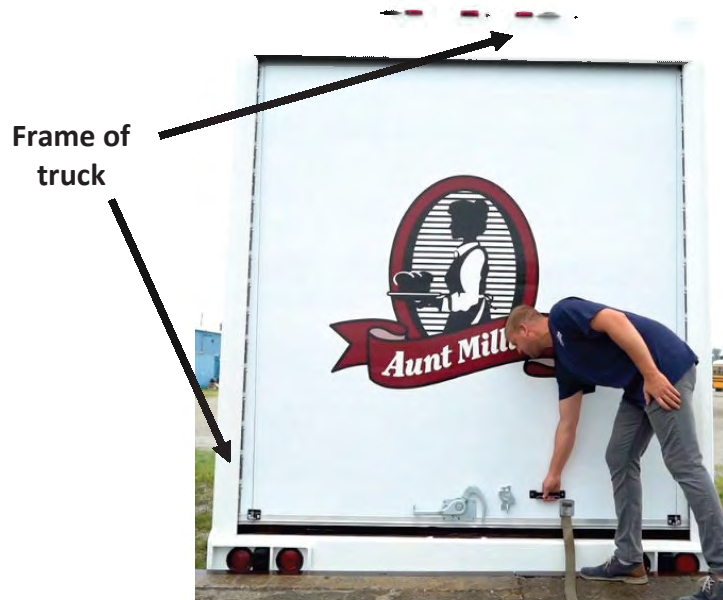


FIG. 1 – Closed Door Position



FIG. 2 – Open Door Position

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17. An insulated overhead door that is designed to roll open and closed in **tracks** to cover a **door opening having a top and a bottom**,

The accused KNL overhead door, shown below in FIGS. 1-7, is formed from a **foam insulating material** attached to a **thermoplastic membrane** and is therefore insulated. The accused door rolls open (FIG. 2) and closed (FIG. 1) in **tracks**. In the closed position, the accused door covers a **door opening having a top and a bottom**.



FIG. 1 – Closed Door Position



FIG. 2 – Open Door Position

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[claim 17, cont.]
the insulating overhead door
having a **first outermost surface**, a **second outermost surface** opposite the **first outermost surface**,

Shown in FIGS. 1 and 2, and illustrated in FIG. 4, the KNL door has a **first outermost surface** arranged opposite a **second outermost surface**, the **first outermost surface** being the exterior surface shown in FIG. 1 and the **second outermost surface** being the exposed **foam** surface shown in FIGS. 2 and 3. More specifically, claim 1 (at Col. 6, ll. 32-41), expressly defines the **second outermost surface** as being formed by the **foam insulating material**. FIG. 3 below is a close-up of the exposed **foam** surface of the KNL door shown in FIG. 2. Thus, the accused KNL door includes a **second outermost surface** opposite the **first outermost surface** as claimed.



FIG. 3

FIG. 2

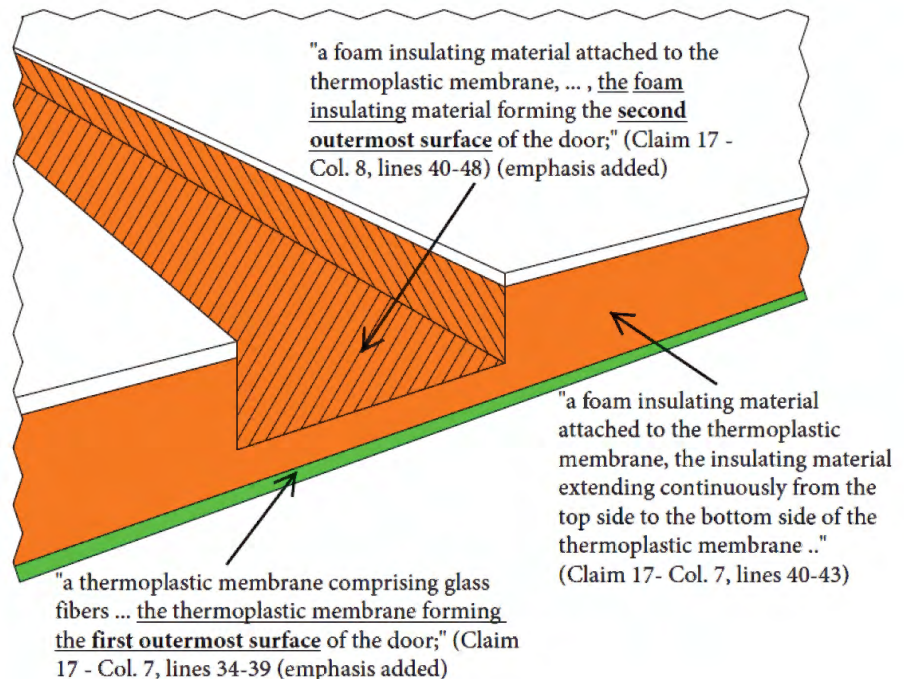


FIG. 4 (Illustration of FIG. 3)

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[claim 17, cont.]

a top surface, a bottom surface, a first side surface and a second side surface, both the **first outermost surface** and the **second outermost surface** being larger than any of the top surface, bottom surface, first side surface and second side surface,

The accused KNL door has a top surface, a bottom surface and first and second side surfaces corresponding to the outer perimeter edge surfaces of the door. The KNL overhead door has an estimated height (H) of 75 inches, a width (W) of 65 inches, and a thickness (T) of 0.5 inch as illustrated below.

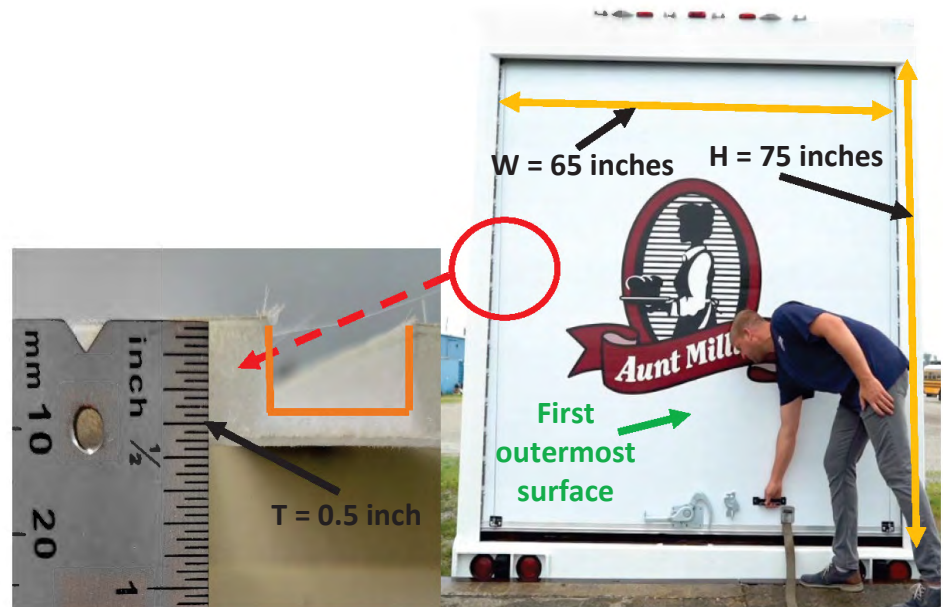


FIG. 1

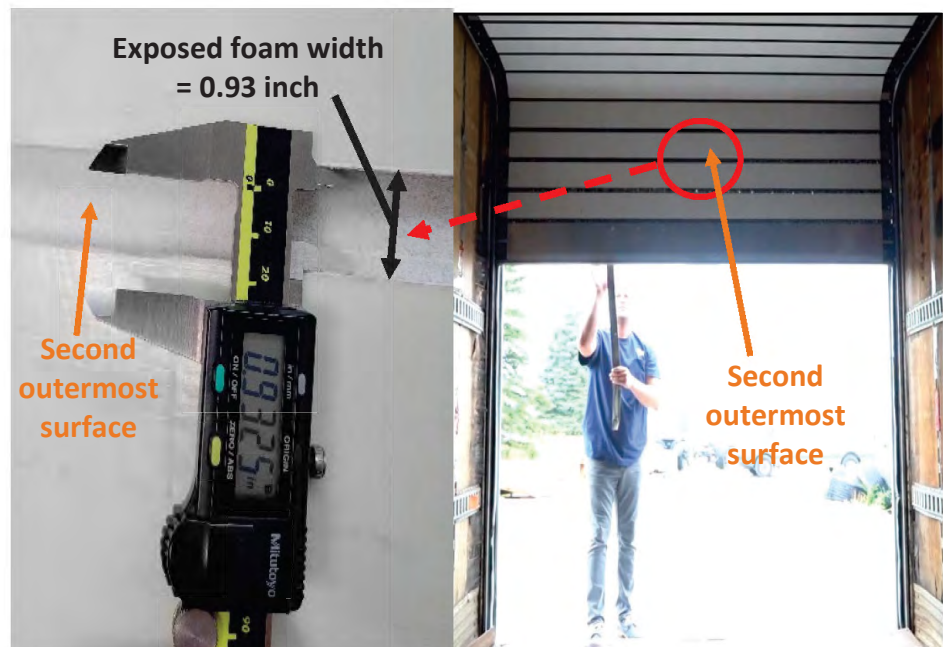


FIG. 2

PRIVILEGED AND CONFIDENTIAL
PREPARED IN ANTICIPATION OF LITIGATION

[claim 17, cont.]

Area Dimensions of KNL insulated overhead door:

- 13) Top (edge) surface = Width x Thickness = 65" x 0.5" = 32.5 square inches
- 14) Bottom (edge) surface = Width x Thickness = 65" x 0.5" = 32.5 square inches
- 15) First side (edge) surface = Height x Thickness = 75" x 0.5" = 37.5 square inches
- 16) Second side (edge) surface = Height x Thickness = 75" x 0.5" = 37.5 square inches
- 17) **First outermost surface** = Width x Height = 65" x 75" = 4,875 square inches, which is greater than any of 1), 2), 3) or 4)
- 18) Total **second outermost surface** = at least 10 second surfaces (cuts) x 60.45 square inches = 604.5 square inches, which is greater than any of 1), 2), 3) or 4)
 - i. Each **second outermost surface** is formed by a strip of exposed foam. The exposed foam width = 0.93"
 - j. Each **second outermost surface** = exposed foam width x door width = 0.93" x 65" = 60.45 square inches
 - k. Each **second outermost surface** is greater than any of 1), 2), 3) or 4)
 - l. Accused KNL door has at least 10 **second outermost surfaces** (i.e. exposed foam insulating material)

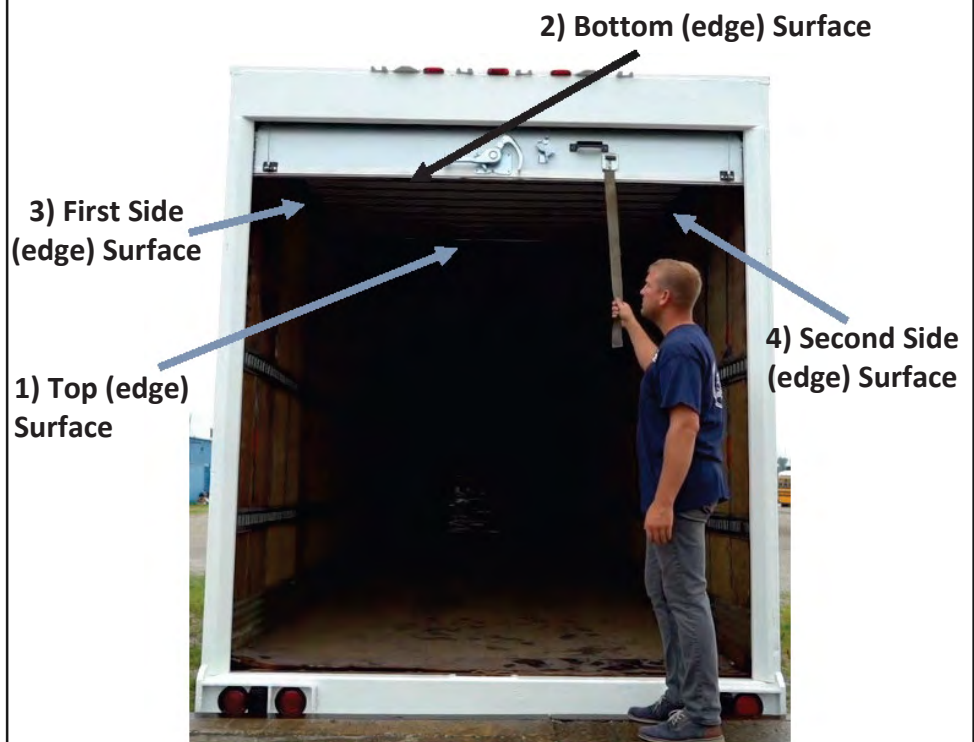


FIG. 7

[claim 17, cont.]

the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the **thermoplastic membrane forming the first outermost surface of the door;**

a **foam insulating material** attached to the **thermoplastic membrane,**

As established by the underlined claim language, the claimed thermoplastic membrane comprising glass fibers forms the **first outermost surface**. As seen above in FIGS. 1 and 2, the thermoplastic membrane forming the **first outermost surface** of the accused KNL door has a top side corresponding to the **top of the door opening** and a bottom side corresponding to the **bottom of the door opening** (See FIG. 1). The membrane forming the **first outermost surface** of the accused KNL door is glass fiber reinforced membrane. Thus, the **first outermost surface** of the accused KNL door is a **thermoplastic membrane comprising glass fibers** as claimed.

As seen in FIG. 3, the accused KNL door has a continuous **sheet of foam insulating material** directly attached to **the thermoplastic membrane**.

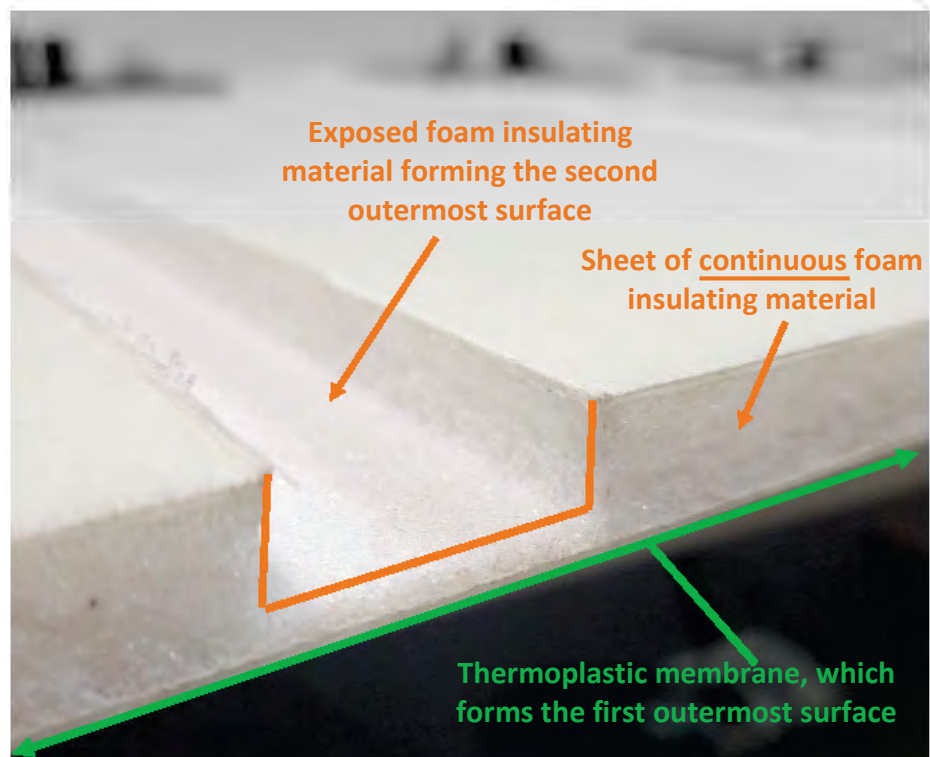


FIG. 3

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[claim 17, cont.]

the **insulating material** extending continuously from the top side to the bottom side of the **thermoplastic membrane**, the **thermoplastic membrane** and **insulating material** forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the **foam insulating material** forming the **second outermost surface** of the door; and

wheels attached to the door allowing the door to fit into **tracks** to guide the opening and closing of the door,

As seen in FIG. 3 and the illustration in FIG. 4, the **foam insulating material** is a continuous layer that has thick sections where the **foam insulating material** is covered by membrane layers and thin sections where the **foam insulating material** is exposed forming the **second outermost surface**. As shown above in FIGS. 2 and 3, the **foam insulating material** extends continuously from the top to the bottom of the **thermoplastic membrane**, thus forming a single panel that is approximately the size of the door opening to be covered, with the length of the single panel being the distance between the top side and the bottom side.

As seen in FIG. 2, and FIG. 5 below, the accused KNL door includes **wheels** attached to the door allowing the door to fit into **tracks** to guide the opening and closing of the door as demonstrated in FIG. 5.

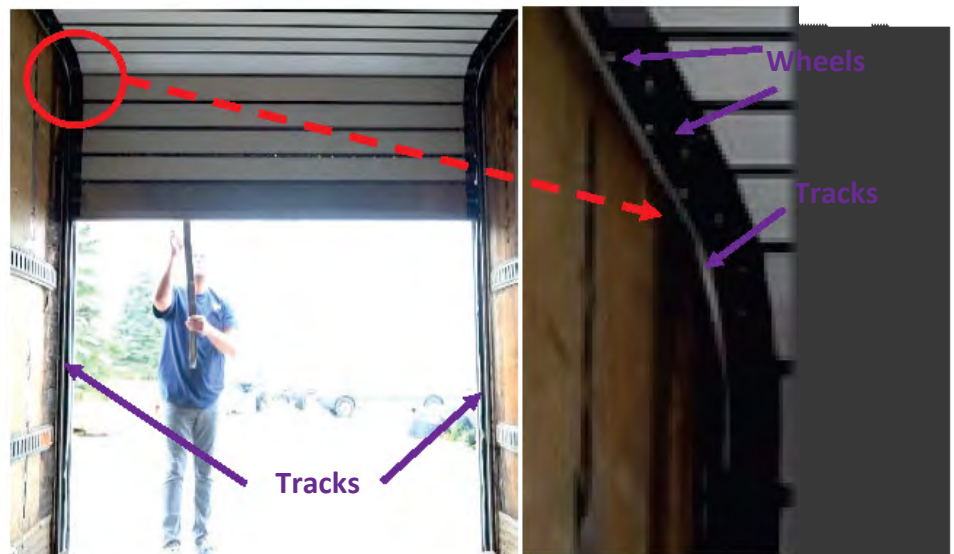


FIG. 5

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<p>[claim 17, cont.]</p> <p>wherein the overhead door comprises only one of the panel, the panel being sufficiently flexible to traverse curved tracks.</p>	<p>As seen throughout the above figures, the accused door comprises only one panel, which is defined in the claim as being formed by the thermoplastic membrane (forming the first outermost surface) and the foam insulating material (forming the second outermost surface). As shown above in FIGS. 1, 2 and 5, the accused KNL single panel door is opened and closed by rolling the single panel door up and down along tracks. Thus, the accused KNL single panel door is sufficiently flexible to traverse the curved tracks as claimed.</p>
<p>19. The insulated overhead door of claim 17, wherein the panel is sufficiently flexible so that the overhead door is capable of traversing tracks of varying radii of curvature ranging from about 5 to about 25 inches.</p>	<p>As seen in FIGS. 2 and 5, the accused KNL door comprises a single panel that is sufficiently flexible so as to be capable of traversing tracks having a radius of curvature that is estimated to be about 10 inches. Thus, the accused single panel is sufficiently flexible to traverse tracks of a radius of curvature between about 5 to about 25 inches as claimed.</p>

EXHIBIT 17



PATENTS • TRADEMARKS • COPYRIGHTS • INTELLECTUAL PROPERTY LITIGATION

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J. Gregory Chrisman
gchrisman@pearne.com

June 27, 2023

Via Electronic Mail and Federal Express
Return Receipt Requested

Jim Schroeder, CEO
Transglobal, Inc.
500 N. Warpole Street
Upper Sandusky, OH 43351

Mark Schroeder, President
Transglobal, Inc.
500 N. Warpole Street
Upper Sandusky, OH 43351

Re: Notice of U.S. Patent No. 9,151,084
Our Ref. RIDGE.J9650

Dear Sirs,

This firm represents Ridge Corporation (“Ridge”) in connection with their respective intellectual property matters. Ridge’s products include composite materials such as Transcore® panels for use in trucks and trailers. Through Ridge’s previous work on a single-panel composite door it became aware of patents owned by Cold Chain, LLC. Ridge is the exclusive licensee of U.S. Patent Nos. 9,151,084 and 10,066,434 to Cold Chain, LLC. Of note, the claims of the ‘084 patent cover single panel, roll up doors for use in trucks, trailers and buildings, along with methods for providing the single panel, roll up doors on tracks for moving the doors during operation. A copy of the ‘084 patent is attached as Exhibit A.

It has come to our client’s attention that Transglobal, Inc. (“Transglobal”) is offering for sale and/or selling a single panel roll door in the United States, for example, as pictured in the attached Exhibit B, that infringes one or more claims of the ‘084 patent. Specifically, the single panel roll door is designed to flexibly roll open and closed in tracks having a radius of curvature to cover a door opening, for instance, an opening in a truck or trailer as pictured in Exhibit B. The door has wheels attached to allow the door to fit into the tracks for guiding the door during opening and closing. Further, the single panel roll door has a first outermost surface formed by

membrane and a sheet of foam attached to the membrane that forms a second outermost surface. Accordingly, the single panel roll door infringes one or more claims of the '084 patent.

Our client is not interested in fostering a protracted dispute with Transglobal, but rather a commercial solution is more desirable. If Transglobal will agree to (i) cease offering for sale and selling the infringing single panel roll door product and (ii) provide us with an accounting of past sales, then our client is willing to negotiate a settlement incorporating a release of its claims and any other mutually-acceptable terms. Because our client is interested in a mutually beneficial business solution, to facilitate a settlement Ridge is willing to offer a sublicense for the Cold Chain patents along with supplying Transglobal with Ridge's high quality Transcore® panels so any future door products are ensured to not infringe the Cold Chain patents. This should give Transglobal comfort knowing that its single panel roll door is a high-quality product that is patent protected.

While our client is actively evaluating how best to act on protecting its valuable rights, it prefers and hopes that we may quickly come to an amicable agreement. Please respond no later than July 21, 2023 to indicate Transglobal's willingness to resolve this matter along the foregoing lines. If we do not hear from you by that date, we will assume that you do not intend to cooperate and will advise Ridge accordingly.


We look forward to your anticipated cooperation in this matter. This letter is without prejudice to my client's rights, all of which are expressly reserved.

Please contact us if you have any questions.

With best regards,



Richard A. Sharpe



J. Gregory Chrisman

JGC/rpk

Enclosures

Exhibit A – U.S. Patent No. 9,151,084

Exhibit B – Transglobal Facebook (<https://www.facebook.com/Transglobaldoor>) selling Single Panel Roll Door

cc: Ridge Corporation
Cold Chain, LLC

Exhibit A



US009151084B2

(12) **United States Patent**
Wachtell et al.

(10) **Patent No.:** **US 9,151,084 B2**
(45) **Date of Patent:** **Oct. 6, 2015**

(54) **INSULATED OVERHEAD DOOR**

(56) **References Cited**

(75) Inventors: **Peter J. Wachtell**, Boise, ID (US);
Daniel M. Aragon, Meridian, ID (US);
John J. Prehn, Boise, ID (US); **Todd J. Lindsey**, Boise, ID (US)

U.S. PATENT DOCUMENTS

(73) Assignee: **COLD CHAIN, LLC**, Boise, ID (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 63 days.

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(21) Appl. No.: **13/585,994**

(22) Filed: **Aug. 15, 2012**

(65) **Prior Publication Data**

US 2013/0042983 A1 Feb. 21, 2013

Related U.S. Application Data

(60) Provisional application No. 61/523,786, filed on Aug. 15, 2011.

(51) **Int. Cl.**

E05D 15/16 (2006.01)

E05B 81/10 (2014.01)

F25D 23/02 (2006.01)

E06B 3/80 (2006.01)

(52) **U.S. Cl.**

CPC **E05B 81/10** (2013.01); **E05D 15/16** (2013.01); **E06B 3/80** (2013.01); **F25D 23/021** (2013.01); **Y10T 292/11** (2015.04)

(58) **Field of Classification Search**

USPC 160/201, 230, 231.1, 231.2, 232, 23.1, 160/270, 271, DIG. 8; 296/146.8

IPC F25D 23/021; E05D 15/20; E06B 3/80, 2003/7044, 2003/7049, 2003/7051, E06B 2003/7053

See application file for complete search history.

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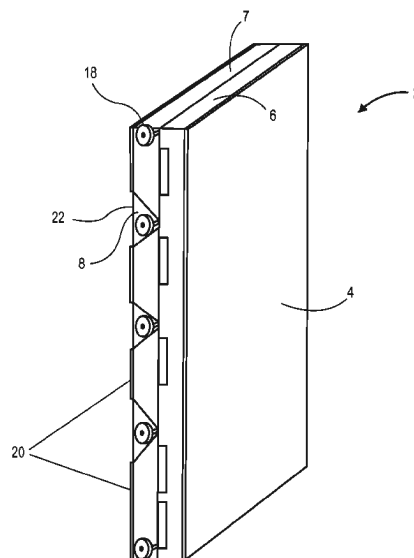
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(74) *Attorney, Agent, or Firm* — MH2 Technology Law Group, LLP

(57) **ABSTRACT**

An article of manufacture for use as an insulated overhead door that is designed to roll open and closed in tracks, with a sheet of thermoplastic material that acts as the outer door membrane and barrier to entry, a sheet of insulating material that acts as a base insulating barrier adhered to the thermoplastic membrane.

19 Claims, 2 Drawing Sheets



U.S. Patent

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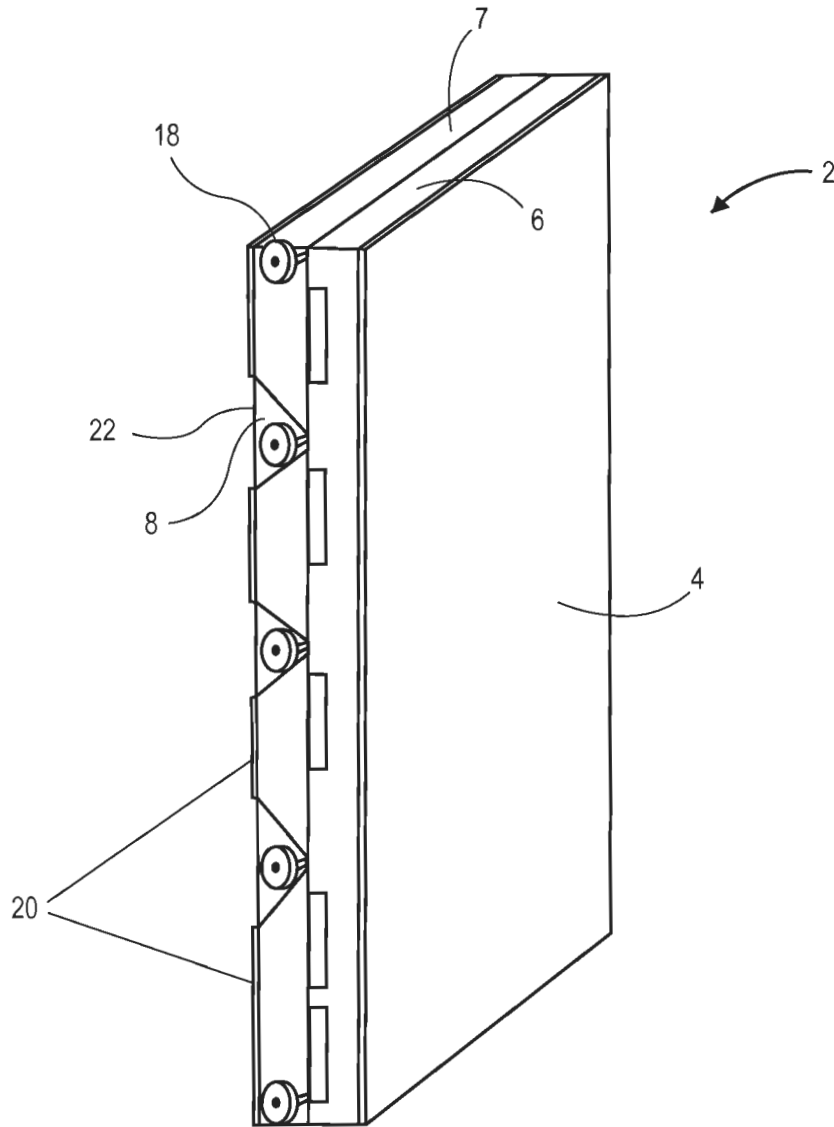


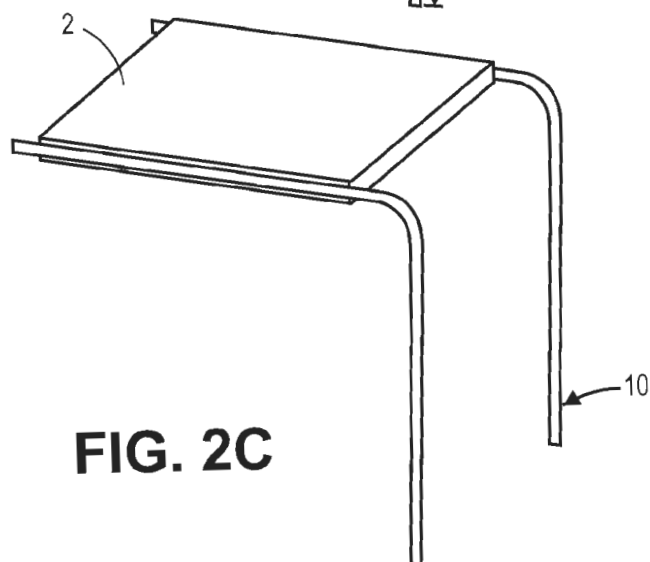
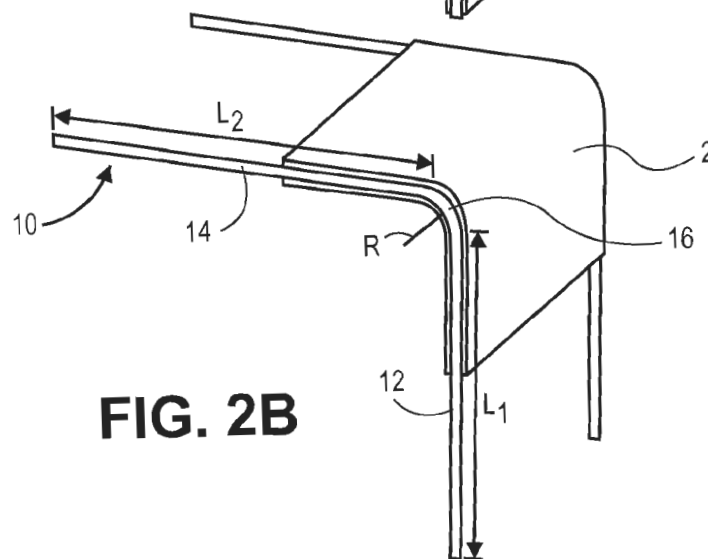
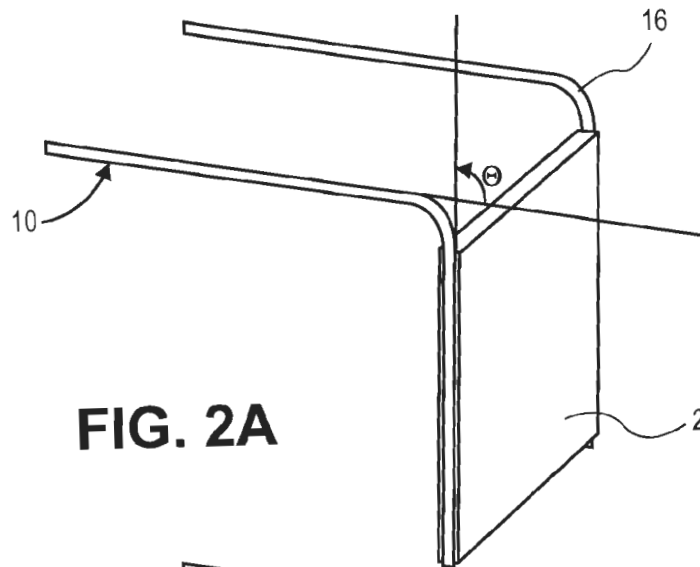
FIG. 1

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INSULATED OVERHEAD DOOR

This application claims benefit of U.S. Provisional Application No. 61/523,786, filed Aug. 15, 2011, the disclosure of which is hereby incorporated by reference in its entirety.

BACKGROUND

This invention relates generally to the field of overhead insulated doors and, more specifically, to an insulated overhead door that is designed to roll open and closed in tracks.

In the cold storage distribution industry, insulated doors of various types are used to cover openings between cold areas and warm areas. Depending upon the locations and use of the opening, the doors may be opened multiple times each day, which can result in increased energy costs for maintaining desired temperatures of cold storage containers. Over time, the industry has developed and used doors with increasing insulating qualities (R-value) and with door opening assistance mechanisms (springs and counter weights) that allow for the door to be quickly opened and closed. The speed with which a door can be opened and closed is important as the more that the door can be kept closed, the more energy is saved from having to cool the cold side of the door, and the better the condition of the material that is being kept cool.

With regard to refrigerated trucks, most outer doors that are used for loading and unloading the interior truck space are made of a series of hinged horizontal metal panels filled with insulating foam material. These sections are hinged together to form a single flexible door unit that is sized to fit the opening to be covered. This single unit with several hinged sections is designed to slide up and down in tracks, with the hinged sections allowing the door to bend such that it can slide up and around a curved track path and be suspended in the tracks directly overhead from the refrigerated interior of the truck.

The current state of insulated overhead truck doors is such that they are heavy (e.g., 500+ lbs.), have a lower R-value than that desired by the shippers, and can require large numbers of hinges and other hardware for their construction. There can be significant costs associated with the regular servicing and maintenance of the hinge hardware. In addition to these drawbacks, because the current doors are made up of several separate panels held together by hinges, painting the truck door or applying the company logos or other advertisements to the back panel of the door can be complicated and expensive due, in part, to the need to align the message across multiple panels so as to be readable when door is in the closed position. If a single panel of the door is damaged and requires replacement, the entire door may need to be cleaned and repainted. Further, the doors often employ complicated gaskets in an attempt to provide an improved seal between each of the panel sections. Even then, the multiple horizontal panel design reduces the thermal performance of the entire door.

Due to the heavy nature of most existing overhead doors, large assistance springs or counter weights are often fitted to the door to enable a driver to open and close the door. The springs and/or counter weights increase the total cost and complicate installation of the doors on the truck. In addition, due to the weight of the door, automated systems for opening and closing these doors have not been commercially successful because they are generally considered to be too slow to be useful.

SUMMARY

One or more of the following advantages may be realized by the doors of the present disclosure: a door with a higher

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R-value for openings designed to utilize an overhead door that runs on tracks; elimination of horizontal seams in the door that result in air leaks and heat intrusion and cause a reduction of the overall thermal performance of the door; providing an improved, seam free door surface for affixing decals, logos or advertising information; providing a simpler door with fewer parts used for its manufacture than many existing doors and a reduction of maintenance costs; reducing the weight of the door to allow a trailer to carry increased amounts of freight; and providing a door that easily utilizes existing overhead track technologies.

The present disclosure addresses some of the current problems with existing overhead door technology, and in particular, the problems associated with insulated doors used in the cold storage industry, such as on delivery trucks for cold storage distribution. By looking at the existing materials that are used in the current door technology, it was determined that finding a lighter weight solution would be advantageous, and that new closed cell foam insulation material existed that could provide a higher R-value with less weight than existing door panels. In attempting to construct a lighter weight version of an operating door, it was apparent that the hinged door design dictated that the door be cut into discreet sections that could be hinged together so as to allow the door to open and close by traversing along curved tracks, thereby positioning the door out of the way of the driver for loading and unloading the truck.

The inventors of the present disclosure realized that if suitable materials are used, single panel overhead doors can be made that are sufficiently flexible to open and close in curved tracks, as described in detail herein. This would allow for overhead doors having one or more advantages, such as higher R-value for insulation, reduced heat intrusion into a cooled space and reduced weight or elimination of springs and counterweights. Other advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

An embodiment of the present disclosure is directed to an insulated overhead door that is designed to roll open and closed in tracks. The overhead door comprises a thermoplastic membrane. A sheet of insulating material is attached to the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel. Wheels are attached to the door allowing the door to fit into tracks to guide the opening and closing of the door. The overhead door comprises only a single panel.

Another embodiment of the present disclosure is directed to an overhead door assembly. The overhead door assembly comprises a set of curved tracks. An insulated overhead door is configured to roll open and closed in the tracks. The overhead door comprises a thermoplastic membrane. A sheet of insulating material is attached to the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel. Wheels are attached to the door allowing the door to fit into tracks to guide the opening and closing of the door. The overhead door comprises only a single panel.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

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FIG. 1 is a perspective view of an insulated door, according to an embodiment of the present disclosure.

FIGS. 2A to 2C illustrate an insulated door at different positions on a track, according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

In the following detailed description, reference is made to the accompanying drawings that form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that various changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense.

Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

In accordance with an embodiment of the disclosure, there is disclosed an article of manufacture for use as an insulated overhead door that is designed to roll open and closed in curved tracks. The door comprises for example, a single sheet of thermoplastic material that acts as the outer door membrane and barrier to entry. The overhead door can also include a single sheet or multiple sheets of material that can act as a base insulating barrier. The door can also include suitable hardware for allowing the door to fit into tracks so as to guide the opening and closing of the door. For example, the door can comprise blocks to which wheels with bearings may be affixed.

FIG. 1 illustrates an overhead door 2, according to an embodiment of the present disclosure. A thermoplastic membrane 4 can be affixed to an insulating material 6 in any suitable manner so as to form a single panel capable of flexing as it traverses curved tracks. For example, the thermoplastic membrane 4 can be cut or otherwise formed to be approximately the size of the opening to be covered. Insulating material 6 can be affixed to thermoplastic membrane 4 using an adhesive or other fastener. In an embodiment, the fastener can be suitable for cold temperature performance. Suitable techniques for affixing the insulating material to the thermoplastic membrane 4 are well known in the art.

In another embodiment, the thermoplastic membrane 4 can be applied to the insulating material 6 in a liquid form, such as by spraying or coating in any suitable manner. The thermoplastic membrane 4 can then be dried or cured on the insulating material 6. The Insulating material 6 can be cut to size either before or after the thermoplastic membrane 4 is applied.

In an embodiment, the thermoplastic membrane 4 comprises a flexible, durable polymeric material that will protect the insulating material 6 from physical damage and from the elements, including moisture. It can also include other materials, such as fiber glass, to strengthen and/or provide the desired flexibility versus stiffness or other desired properties. Examples of suitable thermoplastic membrane materials include, for example, polypropylene impregnated with glass fibers and laminated together to create a directional structure, such as VERSATEX® VX or VERSATEX VR, both available

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from US Liner based in Cranberry Township, Pa. Other examples of suitable thermoplastic membrane material include poly vinyl chloride (PVC) combined with rubberizing agents to increase flexibility, which are well known in the art; or polyurea and/or polyurethane applied directly to the foam or any other acceptable substrate, such as the spray on liners available from LINE X Protective Coatings of Huntsville, Ala., or Rhino Linings Corporation of San Diego, Calif.

Examples of insulating materials include foam. Suitable foams can include, for example, closed cell foams, such as ethylene vinyl acetate ("EVA") foam, which is a copolymer of ethylene and vinyl acetate and is available from many sources. The weight percent vinyl acetate may vary, for example, from about 10% to about 40%, based on the total weight of the EVA material, with the remainder being ethylene. Other examples of suitable closed cell foams include polyethylene foams, polypropylene foams or neoprene based foams. Open cell foams, such as polyether based polyurethanes foams or polyester based polyurethane foams, can also be used. All of these listed foams are generally well known in the art.

In an embodiment, solid blocks or any other suitable hardware may be attached to the thermoplastic membrane to allow for the attachment of wheels 18 (which may or may not include bearings), such that the door may be run in overhead door tracks.

In an embodiment, foam blocks 7, as illustrated in FIG. 1, (such as EVA foam or any other insulating material, including any foam discussed herein) may be adhered to, for example, an initial sheet of foam, such as closed cell foam, that is employed as insulating material 6. In this manner, a door with an increased R-value may be provided. The insulating foam can be bonded together in any suitable manner. Techniques for bonding insulating foam together, such as with adhesives, are well known in the art.

The insulating foam can optionally include compression gaps 8, examples of which are shown in FIG. 1. The compression gaps 8 in the foam material allow the foam to more easily bend during the opening and closing of the door. The compression gaps 8 can be formed between the foam blocks, as illustrated. Alternatively, the compression gaps 8 can be formed partially through a foam sheet, such as where a second foam sheet is used to replace some or all of the foam blocks bonded to the first foam sheet shown in FIG. 1. In yet another embodiment, compression gaps 8 could be formed in the foam sheet illustrated in FIG. 1.

Due to the flexibility of the thermoplastic membrane 4 and foam composite, the doors of the present disclosure can be made as a single integral unit, or panel, that is approximately the size of the door opening, without having to hinge together multiple sections to allow the door to traverse a curved track. In an embodiment, the single laminate door section can flex sufficiently to traverse an existing track. FIGS. 2A to 2B illustrate a door 2 flexing to traverse tracks 10, according to an embodiment of the present disclosure. The tracks 10 can be attached to, for example, a truck or enclosed trailer used for cold storage during transport. Alternatively, the tracks 10 can be attached to a building for which thermally insulated doors are desired, such as might be used for cold storage on a walk-in freezer or refrigerated warehouse, or a garage door.

The tracks 10 comprises a track portion 12 of a first length, L_1 , positioned at an angle, Θ , relative to track portion 14 of a second length, L_2 , as shown in FIG. 2A. Θ can range, for example, from about 80° to about 125°. In an embodiment, Θ is approximately 90°. In an embodiment, the door is positioned substantially horizontally from a point near the top of the door opening, so that most or all of the door is in a

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substantially vertical position when closed and most or all of the door is in a substantially horizontal position when open (assuming the truck or refrigerated container the tracks **10** are attached to is positioned on a substantially level surface).

In embodiments, the track portions **12** and **14** can be relatively straight. In alternative embodiments, the track portions **12** and **14** can be somewhat curved.

A third curved track portion **16** connects the first portion **12** and second portion **14**. Curved track portion **16** can be curved in any suitable manner that will provide the transition between the relative angles of track portion **12** and track portion **14**. The door **2** is designed so that it is capable of flexing to traverse the curved track portion **16**. In an embodiment, the portion of door **2** traversing the curve track portion **16** will generally curve to approximate the curved shape of the curved track portion **16**. For example, all or a part of track portion **16** can be curved in a circular arc so that the inner path contacted by the wheels has a radius of curvature, R (illustrated in FIG. 2B), where R can range, for example, from about 1 inch to about 25 inches, such as about 5 inches to about 18 inches.

The density of the closed cell foam combined with the thermoplastic liner thickness provides enough stiffness to create a good seal around the edge of the door when the panel is in the closed position, yet may be flexible enough to bend across the horizontal dimension up to, for example, approximately 90 degrees when running through the curved portion of the tracks **10**. The flexibility may be increased or decreased by modifying the densities and thicknesses of the foam and liners that are combined such that the panel is able to flex over a very tight radius or a longer radius track curve as a particular door opening and track curvature dictates.

The wheels **18** can be affixed to the door in any suitable manner so that the wheels **18** are positioned to fit into the tracks **10**. There are many ways to attach the wheels to the door. For example, the wheels **18** can be mounted using blocks, as discussed above, or brackets. Wheels with sleeves might also be employed to attach the wheels **18** to the door, as is well known in the art.

An optional flexible membrane **20** can also be employed, as illustrated in FIG. 1. The flexible membrane **20** can be made of any suitable flexible material, such as cloth, plastic or rubber sheeting. Optional flexible covers **22** can be employed at the hinge locations, if desired, as is also illustrated in FIG. 1. The flexible covers **22** can also be made of any suitable flexible material, such as those listed for the flexible membrane **20**. In an alternative embodiment, the flexible membrane **20** and flexible covers **22** can be a single integral piece of flexible material.

The door can be any desired size or shape. Example door sizes can range from about 6 feet to about 10 feet in width, and about 6 feet to about 12 feet in height. The thickness of the door can be fashioned up to, for example, 12 inches in thickness. Example R values for the door can range from about 14 to about 50. The R value can be increased by increasing the thickness of the door and the amount of EVA foam that is used.

In an embodiment, the door is relatively light weight, so that it can easily be opened and closed by a manual process, or by use of an automatic system, such as, for example, electric, hydraulic or pneumatic systems. These systems can be made to be very efficient at quickly opening and closing doors that are lightweight. Furthermore, the use of these systems may allow the door's opening trigger to be manual or to be automatic based upon the approach of the driver carrying, for example, an RFID transmitter (not shown).

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Other alterations or changes to the design of the embodiment of FIG. 1 can also be made. For example, rather than employing insulating foam blocks, as illustrated in FIG. 1, the insulating foam sheet can be employed without the foam blocks, in combination with the sheet of thermoplastic material. Further, the location and number of wheels **18** can also be changed. Still other alterations can be made, as would readily be understood by one of ordinary skill in the art.

While the invention has been described in connection with various detailed embodiments, the description is not intended to limit the scope of the invention to the particular forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom, the insulated overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface, a top surface, a bottom surface, a first side surface and a second side surface, both the first outermost surface and the second outermost surface being larger than any of the top surface, bottom surface, first side surface and second side surface, the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the thermoplastic membrane forming the first outermost surface of the door;

a sheet of foam insulating material directly attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the foam insulating material forming the second outermost surface of the door; and

wheels attached to the door allowing the door to fit into tracks to guide the opening and closing of the door,

wherein the overhead door comprises only one of the panel, the panel being flexible along the entire length of the panel so as to be capable of approximating the curvature of curved tracks having a radius of curvature ranging from about 5 inches to about 25 inches, where the track has a first length positioned at an angle, Θ , relative to a track portion of a second length, wherein Θ ranges from about 80° to about 125°.

2. The insulated overhead door of claim 1, wherein the thermoplastic membrane is a single sheet.

3. The insulated overhead door of claim 1, wherein the thermoplastic membrane comprises polypropylene impregnated with glass fibers.

4. The insulated overhead door of claim 1, wherein the insulating foam comprises compression gaps configured to allow the foam to more easily bend during opening and closing of the door.

5. The insulated overhead door of claim 1, wherein the insulating material is closed cell foam.

6. The insulated overhead door of claim 5, wherein the closed cell foam comprises ethylene vinyl acetate.

7. The insulated overhead door of claim 5, wherein the closed cell foams is chosen from polyethylene foams, polypropylene foams or neoprene based foams.

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8. The insulated overhead door of claim 1, wherein the insulating material is an open cell foam.

9. The insulated overhead door of claim 1, further comprising an additional membrane that is not the thermoplastic membrane.

10. The insulated overhead door of claim 1, the door having an R value ranging from about 14 to about 50.

11. A method comprising:

providing the insulated overhead door of claim 1 on tracks, at least a portion of the tracks being curved; and moving the insulated overhead door so that a portion of the thermoplastic membrane and a portion of the insulating material flex to allow the door to traverse the curved portion of the tracks.

12. An overhead door assembly comprising:

a set of curved tracks; and

an insulated overhead door configured to roll open and closed in the tracks to cover a door opening having a top and a bottom, the overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface, a top surface, a bottom surface, a first side surface and a second side surface, both the first outermost surface and the second outermost surface being larger than any of the top surface, bottom surface, first side surface and second side surface, the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening when the door is in a closed position, the thermoplastic membrane forming the first outermost surface of the door;

a sheet of foam insulating material directly attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the foam insulating material forming the second outermost surface of the door; and

wheels attached to the door allowing the door to fit into tracks to guide the opening and closing of the door, wherein the overhead door comprises only one of the panel, the panel being flexible along the entire length of the panel so as to be capable of approximating the curvature of curved tracks having a radius of curvature ranging from about 5 inches to about 25 inches, where the track has a first length positioned at an angle, Θ , relative to a track portion of a second length, wherein Θ ranges from about 80° to about 125°.

13. A truck comprising the insulated overhead door assembly of claim 12.

14. A cold storage trailer comprising the insulated overhead door assembly of claim 12.

15. A building comprising the insulated overhead door assembly of claim 12.

16. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom, the insulating overhead door consisting of:

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a flexible thermoplastic membrane having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the flexible thermoplastic membrane comprising polypropylene impregnated with glass fibers;

a sheet of flexible foam insulating material attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side; and

wheels attached to the door with wheel attachment hardware, the wheels allowing the door to fit into tracks to guide the opening and closing of the door,

wherein the panel is flexible along the entire length of the panel so that the overhead door is capable of traversing tracks of varying radii of curvature ranging from about 5 inches to about 25 inches, where the track portion has a first length positioned at an angle, Θ , relative to a track portion of a second length, wherein Θ ranges from about 80° to about 125°.

17. An insulated overhead door that is designed to roll open and closed in tracks to cover a door opening having a top and a bottom, the insulating overhead door having a first outermost surface, a second outermost surface opposite the first outermost surface, a top surface, a bottom surface, a first side surface and a second side surface, both the first outermost surface and the second outermost surface being larger than any of the top surface, bottom surface, first side surface and second side surface, the door comprising:

a thermoplastic membrane comprising glass fibers and having a top side corresponding to the top of the door opening and a bottom side corresponding to the bottom of the door opening, the thermoplastic membrane forming the first outermost surface of the door;

a foam insulating material attached to the thermoplastic membrane, the insulating material extending continuously from the top side to the bottom side of the thermoplastic membrane, the thermoplastic membrane and insulating material forming a panel that is approximately the size of the door opening to be covered, a length of the panel being the distance between the top side and the bottom side, the foam insulating material forming the second outermost surface of the door; and wheels attached to the door allowing the door to fit into tracks to guide the opening and closing of the door, wherein the overhead door comprises only one of the panel, the panel being sufficiently flexible to traverse curved tracks.

18. The insulated overhead door of claim 17, wherein the foam insulating material comprises foam blocks configured to increased an R-value of the door.

19. The insulated overhead door of claim 17, wherein the panel is sufficiently flexible so that the overhead door is capable of traversing tracks of varying radii of curvature ranging from about 5 inches to about 25 inches.

* * * * *

Exhibit B

Transglobal Facebook page interface showing profile information, photos, and posts.

Transglobal Door
 500 N Warpole St, Upper Sandusky, OH, United States, Ohio
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 jchamberlin@transglobaldoor.com
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Photos See all photos

Grid of photos including:

- "We are HIRING" sign
- Group of people on a golf course
- Transglobal logo with text: "Reset. Restart. Refocus. As many times as you need to. Just don't quit."
- "IT'S TUESDAY" sign with Einstein
- "MEMORIAL DAY MEMBER AND HONORARY" sign
- "MONDAY IS A STATE OF MIND. It's on your positive part and get stuff done."
- "HAPPY WEDNESDAY" sign with a sun
- "IT'S A NEW MONDAY" sign with text: "New Week, New Goals, New Attitude. Let's Do This!"

Posts:

Transglobal Door March 9 · 🌐
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